86-534

No.

Supreme Court, U.S.
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JOSEPH F. SPANIOL, JR.
CLERK

IN THE

Supreme Court of the United States

OCTOBER TERM, 1986

CBS INC.,

Petitioner,

vs.

MOLECULON RESEARCH CORPORATION,

Respondent.

PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

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September 29, 1986

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QUESTIONS PRESENTED

1. Is the decision below of the Court of Appeals for the Federal Circuit in conflict with the decision of this Court in *Egbert v. Lippmann* 104 U.S. 333 (1881) concerning the question:

Whether the defense of public use under 35 U.S.C. 102(b) is established where, prior to the critical date, the inventor demonstrated and explained working models of his invention to friends and colleagues at college, at his home and at his place of employment and also gave a third person a working model of his invention to take home whereby it was removed from the inventor's possession and personal charge, and all of the foregoing took place without any express reservation of secrecy or confidentiality?

2. Whether this Court should intervene where (a) the Court of Appeals for the Federal Circuit in this case has sanctioned an approach to claim interpretation, previously approved by the Court of Claims, permitting unclaimed structure having perceived advantages not mentioned in the patent to be included in the claims in order to prevent the claims from being held invalid for obviousness under 35 U.S.C. 103, and (b) the Court of Appeals for the Federal Circuit had previously rejected such claim interpretation, as approved by the Court of Claims, and had refused to permit unclaimed structure to be used to support the patentability of such claims?

3. Is the decision below of the Court of Appeals for the Federal Circuit in conflict with the procedural requirements of Rule 52(a) Fed. R. Civ. P. as established by this Court in *Pullman-Standard v. Swint*, 457 U.S. 273 (1982) concerning the question:

Whether the Court of Appeals for the Federal Circuit may on its own make findings relating to a document that is relevant and in evidence where such document was not considered by the district court and on which the district court made no findings?

PARTIES

Pursuant to Rule 28.1, the lists of parents, subsidiaries and affiliates of CBS Inc. appears *infra* (App. A, p. A-68).

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OPINIONS BELOW

The opinion of the Court of Appeals for the Federal Circuit (App. A, p. A-1) is reported at 793 F.2d 229. The opinion of the District Court is reported at 594 F.Supp. 1420 (App. A, p. A-22).

JURISDICTION

The judgment of the Court of Appeals for the Federal Circuit was entered on May 16, 1986 (App. A, p. A-60). The Order of the Court of Appeals denying the Petition for Rehearing of CBS, Inc. was entered on July 1, 1986 (App. A, p. A-59). The mandate of the Court of Appeals issued on July 8, 1986 (App. A, p. A-60). The jurisdiction of this Court is invoked under 28 U.S.C. §1254(1).

STATUTES INVOLVED

Sections 102(b), 103, 112, second paragraph, and 301 of the Patent Act, Title 35 U.S.C., and 28 U.S.C., ¶¶ 1254(1), 1331, and 1338(a) are reproduced in Appendix A (p. A-61, 62).

STATEMENT OF THE CASE

This is an action for patent infringement, initially alleging infringement of claims 1-2, 3-5, 6 and 9 of U.S. Patent No. 3,655,201 ("Nichols patent") (App. B, p. B-1) brought by Moleculon Research Corp. ("Moleculon") as assignee of the inventor Larry B. Nichols ("Nichols") against CBS Inc. ("CBS") as successor to Ideal Toy Corporation ("Ideal").

The accused products are the once popular 3x3x3 Rubik's Cube Puzzle, plus two 2x2x2 and one 4x4x4 cube puzzles.

Claims 1 and 2 were disclaimed by Moleculon. The district court adjudged Claim 6 invalid under 35 U.S.C. §103 in light of two prior art patents to Gustafson. No appeal was taken from the holding of invalidity of Claim 6.

The district court adjudged that Claims 3-5 were valid and infringed by each accused cube; Claim 9 was adjudged valid but infringed only by the two 2x2x2 cubes.

The Court of Appeals for the Federal Circuit affirmed the holding of validity of Claims 3-5 and 9 as well as infringement of Claim 9. In regard to Claims 3-5, the Court of Appeals for the Federal Circuit held that there was no literal infringement and remanded to the district court for consideration the issue of whether the 3x3x3 and 4x4x4 cubes infringed Claims 3-5 under the Doctrine of Equivalents.

Federal jurisdiction in the court of first instance is based upon Title 28 U.S. Code §§1331 and 1338(a).

A. *The Nichols Patent*

The Nichols patent discloses a puzzle which, in its principal embodiment, is formed of eight cube pieces that are engaged together to form a composite 2x2x2 cube. The exposed surfaces of the cube pieces are provided with different indicia which together form a puzzle pattern. The object of the puzzle is to randomize the puzzle pattern and then to return the puzzle pattern to its unrandomized form by rotating different groups of four cube pieces around three mutually perpendicular axes of rotation. Claim 9 calls for precisely the puzzle pattern identified by the district court as the Nichols inventive "concept", i.e. six visually distinct indicia on the six cube surfaces. Claims 3-5 are broader in that the claimed pattern encompasses virtually any surface indicia, such as two colors, as long as they are formed by the combined outer surfaces of the cube pieces.

When it came time to apply for a patent Nichols included his specific 2x2x2 puzzle but he also endeavored to cover other possible forms of the concept, of which the 2x2x2 cube was only one embodiment. Nichols described his concept as not being limited to cubical forms; whether it was a big cube cut into eight smaller cubes or a sphere cut into eight octants, the principal of the division of space itself into eight parts was the same in both cases. Nichols stated that once the eight component structure existed, whether it was a cube out of cubes or a sphere out

of octants, the operation to be performed on all of them was the rotation of the components on one side of the plane vis-a-vis those on the other side of that plane. Accordingly, in addition to the cube form, the Nichols patent states that "a sphere divided into eight octants represents the same concept in a different form," (App. B, p. B-3 Col. 2, lines 31, 32) and Fig. 4 is an illustration thereof.

Nichols told the Patent and Trademark Office that his invention was not limited to cubes or spheres — in fact he described cubes and spheres as merely alternate forms or embodiments of his invention. Nichols' patent does not mention any advantages of one form over another; it never says that any particular form, whether cube, sphere or any other form, is the essence of the invention.

B. *The Gustafson Patents*

Unknown to Nichols during prosecution of his patent, and uncited by the Examiner, were two prior art patents to Gustafson (App. B, p. B-5, B-11). The Gustafson patents disclose a puzzle consisting of eight shell pieces engaged together to form a sphere and arranged to slide circumferentially relative to each other around a central spherical core. The shell pieces are colored on their exposed surfaces so that together they form a puzzle pattern. The Gustafson puzzle is operated by precisely the same rotational steps as called for in Claims 3-5 of the Nichols patent. The Gustafson puzzle pattern is first randomized and then restored to its original form by rotation of different groups of four shell pieces around three mutually perpendicular axes.

Moleculon disclaimed claims 1 and 2 before trial (App. A, p. A-63) because they read on Gustafson's spherical embodiment of Nichols' invention, and the district court found claim 6 invalid as obvious in light of Gustafson. Nichols Claims 3-5 and 9 escaped being declared obvious in light of Gustafson because "the advantages of the Nichols cube as a puzzle would not have been obvious," (App. A, p. A-46, A-47) despite the fact that Nichols himself never suggested to anyone, anywhere, that the cube embodiment of his invention had any advantage as a puzzle over his spherical embodiment.

C. *Citation Of Prior Art*

On May 24, 1982, the day before this action was instituted, Moleculon filed in the United States Patent and Trademark Office a Citation of Prior Art (App. A, p. A-64) under 35 U.S.C. §301 referring to the Gustafson patents. These patents had been brought to the attention of Moleculon by Ideal in August 1981. This document was filed in an attempt to distinguish the patent claims over the Gustafson patents. The Citation was totally ignored by the district court. The Court of Appeals considered the Citation on its own but rather than remanding to the district court to make findings of fact on the Citation the Court of Appeals proceeded on its own to make such findings.

ARGUMENT

A. *Public Use.*

By 1959 Nichols had conceived his invention, reduced it to practice, and completed all experimental use. From then until the critical date, March 4, 1969, he showed and explained working models of the invention to his friends and collegues at college, at his home and at Moleculon—in other words to people everywhere he went. It was not concealed from any person who happened to encounter it, and Nichols did not hesitate to explain the workings of the puzzle when asked to do so. There was no mention of secrecy to anyone.

While working at Moleculon as a scientist in 1968 Nichols made a wooden model of his puzzle. Nichols took the wooden model to his office at Moleculon from time to time to work on it or to play with it. The model was not covered or concealed in Nichols' office. It was seen in Nichols' office by Dr. Arthur S. Obermeyer (Obermeyer), Moleculon's President, and by other employees. Nichols explained to Obermeyer how the puzzle worked. With Nichols permission Obermeyer took the model to his home to study and to evaluate. Obermeyer, in fact, showed the puzzle to his wife. (App. A, p.A-66, 67) Obermeyer was under no express obligation of secrecy or confidentiality.

Within a few days of taking the puzzle home Obermeyer discussed with Nichols the possibilities of commercializing the

puzzle. Obermeyer inquired whether Nichols had any interest in commercializing this puzzle and Nichols expressed no intention of doing anything about the puzzle himself. Obermeyer proposed that Moleculon, which had licensing expertise, explore the possibilities of licensing the puzzle for commercial exploitation. Nichols was promised that he would be compensated for whatever Moleculon obtained as a result of any sales of the invention. Nichols accepted this offer and agreed not to undertake to exploit the puzzle himself. At Obermeyer's insistence Nichols prepared written descriptions of the puzzle for use in connection with future sales efforts. On behalf of Moleculon Obermeyer then contacted Parker Brothers concerning possible disclosure to it of the Nichols puzzle.

All of the foregoing occurred more than one year before the application for the Nichols patent was filed on March 4, 1970. 35 U.S.C. §102(b) provides that "[A] person shall be entitled to a patent unless - . . . the invention was. . . in public use. . . more than one year prior to the date of the application for patent. . ."

The district court found that there was no public use because all uses of the Nichols puzzle prior to the critical date of March 4, 1969 were "private use for his [Nichols] own enjoyment" (App. A. p. A-31). Nichols' interactions with Obermeyer and with others to whom Nichols demonstrated his puzzle were characterized by the district court as "such that Nichols at all times retained control over its [the model's] use as well as over the distribution of information concerning it." (App. A, p. A-32) The district court found that neither Obermeyer nor the others to whom Nichols demonstrated his puzzle were sworn to secrecy but that Nichols had "a legitimate expectation of privacy and confidentiality". (Id.) The district court also found that neither Obermeyer nor the others to whom Nichols demonstrated his puzzle had any basis for inferring that the puzzle was being given over for their free and unrestricted use. (Id.) The Court of Appeals determined that the district court's characterization of the evidence is "entirely apt and we see no ground for reversal". (App. A, p. A-9)

Under this Court's decision in *Egbert v. Lippmann, supra* the defense of public use is established where a transfer of possession and personal charge of a completed invention is made to another without restriction prior to the critical date. In *Egbert*, the inventor and the person to whom the invention was disclosed and by whom it was used prior to the critical date were "intimate friends" (104 U.S. at 335). No explicit restriction as to nondisclosure was placed upon the transferee friend. The inventor eventually married the friend and, at one point, he asked his wife to rip open an old corset in order to show and explain the later patented corset steels to one Joseph A. Sturgis, a friend, in the inventor's home (104 U.S. at 335). On these facts, this Court held that the defense of public use was established.

The decision of this Court in *Egbert* cannot be reconciled with the opinions below. The act of the inventor in *Egbert* in giving the corset steels to his girlfriend is exactly what Nichols did with Obermeyer. The act of the inventor in *Egbert* in showing the corset steels to Sturgis is exactly what Nichols did with his friends, classmates, associates and fellow workers. There is no dispute in the evidence in the present case that all uses of the Nichols puzzle were with Nichols' consent and allowance.

The reason why the Obermeyer use of the Nichols puzzle was a public use was stated in *Egbert* where this Court recognized (at page 337) that the "initimate" girlfriend to whom the invention had been given "might have exhibited them to any person she pleased, or might have made other steels of the same kind, and used or sold them without violation of any condition or restriction imposed on her by the inventor". Obermeyer was similarly free to exhibit it to others, to make other puzzles of the same kind and to use or sell them freely, that is, to do any of the things enumerated by this Court. In addition, when Obermeyer took Nichols wooden cube puzzle home for a few days, he felt free to exhibit it to his wife, and did so, and might have made cubes of the same kind and might have used or sold them without violation of any condition or restriction imposed on him by Nichols. Nichols' transfer of possession and personal charge of the puzzle to Obermeyer constitutes a form of abandonment.

The circumstances in the present case which caused the lower courts to conclude that Nichols retained control, namely that the puzzle was disclosed to "close colleagues" (App. A, p. A-31) whose "personal relationships" (App. A, p. A-31) with Nichols were such that Nichols retained a "legitimate expectation of privacy and confidentiality" (App. A, p. A-32), do not distinguish over *Egbert*. In *Egbert*, the personal relationship between the inventor and his soon to be wife was no more remote, the disclosures no more free and unrestricted, and the control no less evident than what the lower courts concluded in the present case. In *Egbert*, the transfer from the inventor was held to be unrestricted despite the obvious close personal relationship between the inventor and the transferee. Clearly, under *Egbert*, this Court would require some affirmative act on the part of the inventor to place a restriction upon the transfer in order to avoid the later imposition of the defense of public use. The requirement of a restriction in situations where, as here, a surrender of possession and personal charge of a completed invention is made would strengthen the patent system. It would provide certainty and predictability in the law instead of creating gossamer underpinnings for the public use defense arising out of subjective and unspoken expectations of the transferor and transferee.

The writ should be granted because the Court of Appeals for the Federal Circuit has, in the decision below, eroded the defense of public use far beyond what this Court has heretofore permitted. The effect of the decision below is that public use can not be proven where one who surrenders possession and personal charge of a completed invention subjectively relies upon the presumed goodwill of the transferee, even with no evidence that an actual understanding had passed between them. If the decision below stands, public use is not shown either where *nothing* is said to the transferee or where a confidentiality agreement is reached. Accordingly, the public use defense has been eroded to the point of being viable *only* where an express waiver or abandonment occurs. Given the obvious extraordinary degree of public disclosure which can result from successive transfers based upon subjective belief in the goodwill of others, the decision below nearly reads the salutary defense of public use out of the statute.

B. *Obvious*

The Court of Appeals for the Federal Circuit in its decision below has retreated from its interpretation of controlling authorities of this Court in favor of a contrary method of claim construction approved by the Court of Claims, a predecessor court. Specifically the Court of Appeals for the Federal Circuit has permitted the advantages of structure not recited in the patent claims to be considered in connection with the issue of obviousness of those claims under §103. If the claim language as issued is ignored by the courts, and claims are upheld on the basis of unrecited structure having alleged unobvious advantages not disclosed in the specification, the statutory requirement that patent claims "particularly [point] out and distinctly [claim] the subject matter which the applicant regards as his invention" (35 U.S.C. §112, second paragraph) will, in effect, have been abandoned. The result may be to uphold more patents but the lack of certainty as to the scope of claim coverage will be crippling to industry. This court's power of supervision is required to prevent injustice.

The district court found (App. A, p. A-46) and the Court of Appeals agreed (App. A, p. A-11) that patentability of claims 3-5 is premised on the unclaimed but perceived superiority of the cube format as a puzzle as contrasted to the spherical format. Nowhere, however, in his patent does Nichols mention any superiority as a puzzle of one embodiment of his invention over another; nowhere does he premise patentability on superiority of the cubical embodiment over the spherical embodiment. If Nichols had wanted to assert unexpected results or advantages as a reason for non-obviousness for the cube form of his puzzle, he was obligated to state these in his patent - but he did not.

In addition, the district court found that the method of solving Gustafson's spherical form of the invention is identical to the method (Claims 3-5) of solving Nichols cubical form (App. A, p. A-44, 46). Claim 3 reads on Gustafson except for Claim 3 being limited to the cube format. Nevertheless the district court conceded that Claims 3-5 are broad and are not limited to a "preselected pattern" consisting of a distinct indicium on each

of the six faces of the cube (App. A, p. A-45). Neither is the specification of the Nichols patent so limited. The patent specification significantly suggests that "*fewer* than six colors may be used thereby making the restoration of the predetermined pattern *simpler* to achieve" (emphasis added). (App. B, p. B-3, col. 2, lines 36-37).

Nevertheless the district court approached the issue of validity as a contest between puzzles and not as a patent case and thereby relied upon alleged advantages of one puzzle embodiment selected from the patent specification, i.e., the complexity of a puzzle pattern in which each of the 24 exposed faces of the eight cube pieces constitutes a *distinct* element in the puzzle pattern, and held that this inventive "concept" was nonobvious.[1] (App. A, p. A-46) Claims 3-5, which do not define that puzzle pattern, were nevertheless upheld on the basis of this unclaimed puzzle concept. The trial court compared this unclaimed "concept" with the prior art instead of comparing the claims with the prior art as it should have done.

In affirming this approach the Court of Appeals has permitted the advantages of unclaimed structure defining only one of several embodiments covered by Claims 3-5 to distinguish those claims from the prior art. The Court of Appeals has thereby approved the implicit addition of limitations to a claim in order to save the claim from invalidity. The law on this point has been placed in flux by the opinions below.

The Court of Appeals has previously interpreted this Court's decisions[2] as forbidding the addition of unrecited limitations to a claim even where those limitations may be found in the patent specification. *Environmental Designs, Ltd. v. Union Oil Co.*

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[1] Since the cube puzzle has six faces, use of each of the 24 exposed faces of the cube pieces as a "distinct" element of the puzzle pattern requires the use of at least six indicia, e.g., six colors.

[2] *Smith v. Snow*, 294 U.S. 1 (1945); *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, reh den 365 U.S. 890 (1961).

of California, 713 F.2d 693 at 699 (Fed. Cir. 1983) cert den 464 U.S. 1043 (1984); *Raytheon Co. v. Roper Corp.*, 724 F.2d 951,957 (Fed. Cir. 1983) cert den 105 S.Ct. 127(1984); *Jones v. Hardy*, 727 F.2d 1524, 1527-28 (Fed. Cir. 1984).

In the present case, however, the Court of Appeals has retreated from such precedent and has instead implicitly resurrected a minority analytic approach to claim construction previously embraced by the Court of Claims, the precedents of which are also binding on the Court of Appeals.[3] This minority approach would permit limitations in the patent specification to be included in the claims in order to prevent invalidity. *Decca Ltd. v. United States*, 420 F.2d 1010 (Ct. Cl. 1970) cert den 400 U.S. 865 (1970). At least one judge of the Court of Appeals has expressly felt himself bound to follow the precedent of the Court of Claims on this very issue of claim construction. *SSIH Equipment S.A. v. U.S. Intern. Trade Com'n.*, 718 F.2d 365, 384 (Fed. Cir. 1983). The Court of Appeals is thereby revealing ambivalence as to this issue. The problem is acute because the two approaches to claim interpretation yield conflicting results.

There is no question here that reading the advantages of an unclaimed puzzle pattern into Claims 3-5 permitted those claims to survive petitioner's invalidity challenge under 35 U.S.C. §103 in view of Gustafson. The district court found that Gustafson's spherical puzzle is solved by the same rotational steps recited in Nichols Claims 3-5 (App. A, p. A-44, 46). Accordingly, Nichols Claims 3-5 differ from Gustafson only in the use of cubes. That fact alone, however, without reciting the puzzle pattern, does not save Claims 3-5. Like Nichols, Gustafson suggested a variety of possible puzzle patterns. (App. B, p. B-8, Col. 3, lines 41-45). In addition, the district court concluded that the possibility of the cubical form of the Gustafson puzzle would have been obvious to one of ordinary skill in the art (App. A, p. A-46). If more is needed the Nichols patent confirms this conclusion. In the patent text Nichols *equates* his cubical form with his

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[3] In *South Corp. v. United States*, 690 F.2d 1368, 1370 (Fed. Cir. 1982), the Court of Appeals declared itself bound by the precedent of the Court of Claims.

spherical form (App. B, p. B-3, col. 2, lines 31-32). Since the structural differences between Gustafson's spherical puzzle and Nichols' spherical embodiment (Fig. 4 of the Nichols patent) are not significant,[4] Nichols' own admissions establish the obviousness of the puzzle defined by Claims 3-5 in view of Gustafson. Accordingly, Claims 3-5, which do not intrinsically display the unobvious advantages relied upon by the lower courts, would have been held to be invalid under 35 U.S.C. §103 had the district court not credited them with the advantages of unrecited structure.

It is clear therefore that in this case and others like it, the foregoing conflicting analytic approaches to claim construction would yield different results under 35 U.S.C. §103. The existence of conflicting interpretive rules introduces intolerable uncertainties in the statutory structure governing the drafting and enforceability of patent claims.[5] This Court's supervisory authority should be exercised to eliminate the uncertainty and with it any possibility of arbitrary choices between conflicting precedent or methods of claim construction.

C. *The Citation of Prior Art*

The scope of Claims 3-5 and 9 has been hotly disputed in this action. It is well established that, to ascertain the true meaning of disputed claim language, resort should be made to the claims

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[4] The district court said: The only difference between Gustafson's sphere and the Nichols' sphere is that the user of the Gustafson puzzle rotates sets of octant shaped shells which are held into a composite sphere by a tongue-in-groove arrangement involving a spherical core, while the user of the Nichols' sphere rotates sets of octant shaped pieces having a plurality of interior surfaces which are held together in a composite sphere by magnetic or mechanical means. While there is no outright concession by Moleculon in the briefing, I do not understand it to seriously contend that a puzzle designer of ordinary skill having been exposed to the Gustafson sphere would not have realized that Gustafson' shell pieces could be given a third dimension without interfering with their ability to rotate in sets around three mutually perpendicular axes. (App. A, p. A-44, 45)

[5] This is particularly true with respect to ascertaining the differences between the claims and the prior art, a fact finding mandated by this Court in *Graham v. John Deere Co.*, 383 U.S. 1 (1965).

at issue, the specification and the prosecution history. *Loctite Corp. v. Ultraseal Ltd.*, 781 F.2d 861, 867 (Fed. Cir. 1985). Such statements may be used to determine the scope of the claims for the purposes of distinguishing them from the prior art, *Id.*, for literal infringement, *Id.* at 869, and for infringement under the doctrine of equivalents, *Id.* at 870.

The district court failed to consider the Citation of Prior Art, (App. A, p. A-64) which is part of the prosecution history. The Court of Appeals here specifically held that the statements in the Citation, although filed after issuance of the patent, may be considered, with their weight to be determined by the circumstances of the case (App. A, p. A-16), but then proceeded on its own summarily to ignore them.

This Court has held that:

> When an appellate court discerns that a district court has failed to make a finding because of an erroneous view of the law, the usual rule is that there should be a remand for further proceedings to permit the trial court to make the missing findings:
>
> "(F)act finding is the basic responsibility of district courts, rather than appellate courts, and ... the Court of Appeals should not have resolved in the first instance this factual dispute which has not been considered by the District Court." *DeMarco v. United States*, 415 U.S. 449, 450, n.
>
> *Pullman-Standard v. Swint*, 456 U.S. 273, 291 (1982)

In *Pullman-Standard*, this Court found that the Court of Appeals had erred in failing to remand after holding that the district court had failed to consider relevant evidence. The Court of Appeals here impermissibly determined the weight to be given the Citation, a piece of evidence which the district court failed to consider, and should have remanded to the district court for findings of fact on the Citation. It is the provence of the district court, not the Court of Appeals, to make the appropriate findings as to the meaning and weight of the evidence.

In the present case, the statements made in the Citation are directly relevant to the proper interpretation of the scope of Claims 3-5 and 9 in defining what the Nichols claims may *not* include (App. A, p. A-64). Such statements, knowingly made by Moleculon on the day before bringing an action for infringement, constitute a strong admission against interest at a time when the importance of such statements was well known to the maker. Indeed, if the district court finds that these admissions against interest are binding, then the determination of infringement will be reversed.

The writ should be granted because the Court of Appeals impermissibly made its own findings on the meaning and evidentiary weight of the Citation after the failure of the district court to consider it. The Court of Appeals should have remanded to the district court to make these findings in construing the claims, both for the purpose of distinguishing the claims under §103 from Gustafson and for the purpose of determining either literal infringement or infringement under the Doctrine of Equivalents. The Court of Appeals's procedure in finding its own facts on evidence which the district court failed to consider is in direct conflict with this Court's mandate, and this Court should exercise its power of supervision to ensure proper appellate review of decisions in accordance with Rule 52(a) of the Federal Rules of Civil Procedure so that facts are found by the tribunal charged with the task of fact finding in the first instance.

Conclusion

For the reasons stated above, the Court should grant certiorari.

Respectfully submitted,

/s/ _____

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APPENDIX

United States Court of Appeals
For the Federal Circuit

MOLECULON RESEARCH CORPORATION,

Appellee,

-v.-

CBS, INC.,

Appellant.

Appeal No. 85-2096.

DECIDED: May 16, 1986

Before BALDWIN, NIES, and BISSELL, *Circuit Judges.*

BALDWIN, *Circuit Judge.*

This is an appeal from the judgment of the United States District Court for the District of Delaware, reported at 594 F. Supp. 1420, holding claims 3-5 and 9 of Moleculon Research Corporation's U.S. Patent No. 3,655,201 ('201 patent) valid and infringed by certain of the well-known Rubik's Cube puzzles. We affirm in part, vacate in part, and remand.

Background

Moleculon, as assignee of the '201 patent which issued to Larry D. Nichols, sued CBS Inc., as successor to the Ideal Toy Corporation, alleging infringement of claims 3, 4, 5, 6, and 9 of the '201 patent.

Nichols and the '201 patent

A puzzle enthusiast since childhood, Nichols, in the summer of 1957, conceived of a three-dimensional puzzle capable of

rotational movement. He envisioned an assembly of eight cubes attached in a 2x2x2 arrangement, with each of the six faces of the composite cube distinguished by a different color and the individual cubes being capable of rotation in sets of four around one of three mutually perpendicular axes.

During the period 1957-1962, while doing graduate work in organic chemistry, Nichols constructed several paper models of his puzzle, making cubes of heavy file-card type paper and affixing small magnets to the inside of the cubes. Although these models confirmed the feasibility of Nichols' conception, they lacked durability. A few close friends, including two roommates and a colleague in the chemistry department, had occasion to see one of these paper models in Nichols' room and Nichols explained its operation to at least one of them.

In 1962, Nichols accepted employment as a research scientist at Moleculon. In 1968, Nichols constructed a working wood block prototype of his puzzle which he usually kept at home but on occasion brought into his office. In January 1969, Dr. Obermayer, the president of Moleculon, entered Nichols' office and happened to see the model sitting on his desk. Obermayer expressed immediate interest in the puzzle and Nichols explained its workings. Obermayer asked whether Nichols intended to commercialize the puzzle. When Nichols said no, Obermayer suggested that Moleculon try to do so. In March 1969, Nichols assigned all his rights in the puzzle invention to Moleculon in return for a share of any proceeds of commercialization. On March 7, 1969, Moleculon sent Parker Brothers an actual model and a description of the cube puzzle. In the next three years, Moleculon contacted between fifty and sixty toy and game manufacturers, including Ideal. Ideal responded to the effect that it did not currently have an interest in marketing the puzzle. Moleculon itself did not succeed in marketing the Nichols cube.

On March 3, 1970, Nichols filed on behalf of Moleculon a patent application covering his invention. The '201 patent issued on April 11, 1972.

The subject matter of the '201 patent, in its preferred embodiment, is a cube puzzle composed of eight smaller cubelets that may be rotated in groups of four adjacent cubes, and a method by which the sets of cubes may be rotated, first to randomize, and then to restore a predetermined pattern on the six faces of the composite cube.

Claims 3, 4, and 5 are as follows:[1]

> 3. A method for restoring a preselected pattern from sets of pieces which pieces have constantly exposed and constantly nonexposed surfaces, the exposed surfaces adapted to be combined to form the preselected pattern, which sets when in random engagement fail to display said preselected pattern which comprises:
>
> a. engaging eight cube pieces as a composite cube;
>
> b. rotating a first set of cube pieces comprising four cubes about a first axis;
>
> c. rotating a second set of four cubes about a second axis; and
>
> d. repeating steps (b) and (c) until the preselected pattern is achieved.
>
> 4. The method of claim 3 which includes rotating sets of cubes about one of three mutually perpendicular axes, with reference to the composite structure.
>
> 5. The method of claim 3 wherein the sets of cubes are rotated through multiples of 90°.

Claim 9 is the only apparatus claim remaining in the suit:[2]

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[1] Claims 1 and 2 were disclaimed while the case was pending before district court and are not at issue here.

[2] Claim 6 was held invalid by the district court. Moleculon has not appealed that determination.

9. A puzzle comprising eight cubes, visually distinguishable indicia on three faces only of each cubes [sic] with the eight cubes together having six visually distinct indicia,

means associated with each of the remaining faces only of each of the cubes releasably maintaining the cubes in assembled relationship forming a composite cube, said maintaining means enabling three interaffiliated groups of four contiguous cubes each to be rotated respectively about three mutually perpendicular axes, the six distinct indicia being so located on the respective cubes that the cube groups can be rotated to effect the display of a distinct indicia on each of the six faces of the composite cube.

Shown below are Figs. 1 and 2b of the patent:

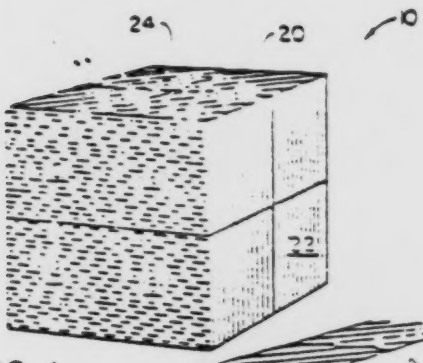


FIG. 1

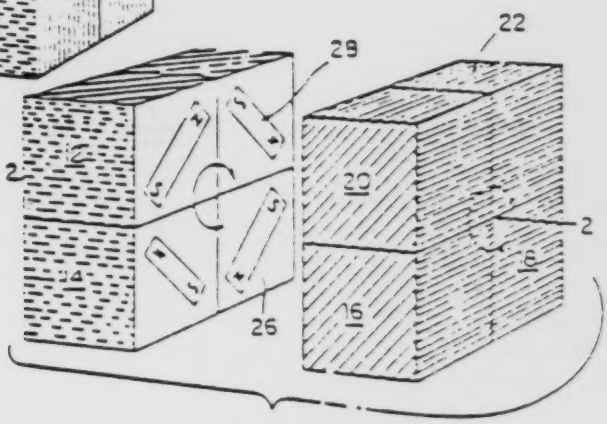
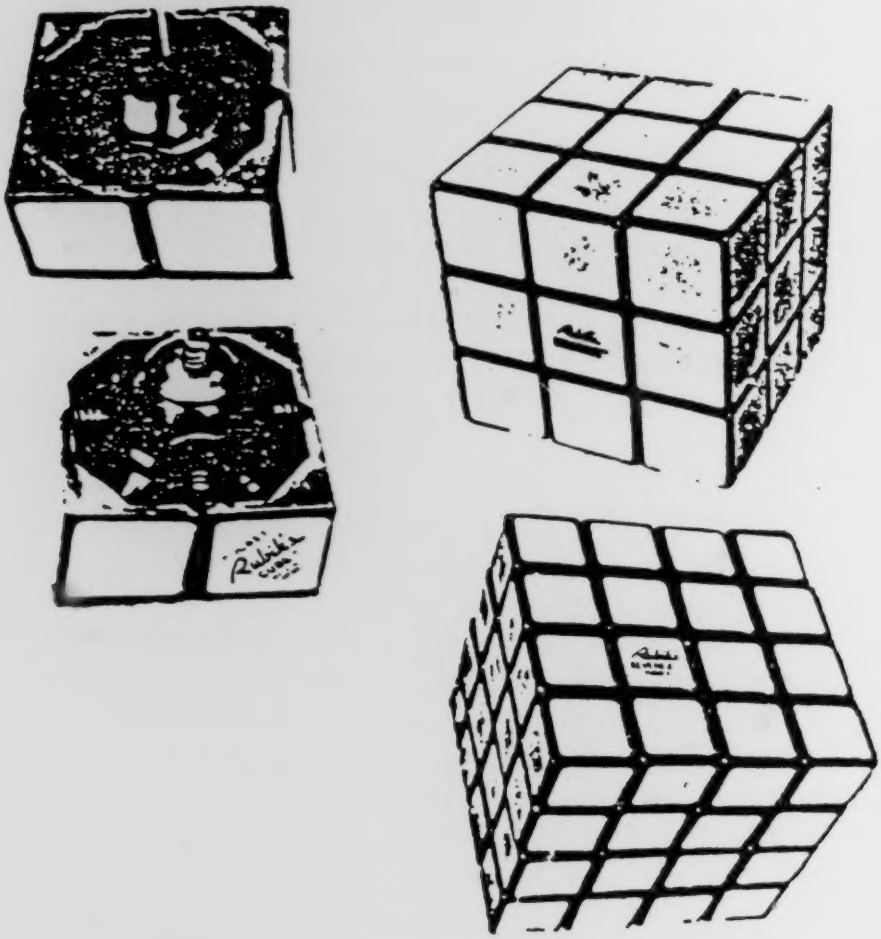


FIG. 2b

The Rubik's Cube and Variations

The accused products are the well-known 3x3x3 Rubik's Cube puzzle, two 2x2x2 variations – a Japanese-made Pocket Rubik's Cube and a Taiwanese-made Pocket Rubik's Cube (pocket cubes), and a 4x4x4 Rubik's Revenge. As shown below, these puzzles externally appear as composite cubes composed of smaller cubes or cubelets (27 for the 3x3x3, 8 for the 2x2x2, and 65 for the 4x4x4):



Internal inspection reveals that the composite cube is not composed of true six-sided cubelets but rather is composed of an internal mechanism holding together cubelet shells which have one or more external faces and permitting sets of cubelets to be rotated about an axis.

Issues

Whether the district court erred in (1) holding that the claimed invention was not in public use nor on sale within the meaning of 35 U.S.C. § 102(b); (2) holding claims 3-5 not invalid for lack of utility and enablement under 35 U.S.C. §§ 101, 112; (3) holding claims 3-5 and 9 nonobvious under 35 U.S.C. § 103; and (4) finding infringement of claim 9 and induced infringement of claims 3, 4, and 5.

OPINION

1. *§ 102(b) on sale and public use bars*

CBS argues that the subject matter of the '201 patent was in "public use" and "on sale" by Nichols, prior to the March 3, 1969 critical date (i.e., one year prior to filing of the patent application), thus rendering the patent invalid under section 102(b).

(a) *Public Use*

CBS labels as public use Nichols' displaying of the models to other persons (such as his colleagues at school) without any mention of secrecy. CBS ascribes only commercial purpose and intent to Obermeyer's use of the wood model and argues that a conclusion of barring public use under § 102(b) is compelled. We disagree.

This is what the district court had to say:

> The essence of "public use" is the free and unrestricted giving over of an invention to a member of the public or the public in general. What I see here, by contrast, is the inventor's private use of his own invention for his own enjoyment. "Private use of one's own invention is permissible." . . .
>
> While it is true that Nichols explained his puzzle to a few close colleagues who inquired about it and allowed

> Obermayer to in fact use it, the personal relationships and other surrounding circumstances were such that Nichols at all times retained control over its use as well as over the distribution of information concerning it. He never used the puzzle or permitted it used in a place or at a time when he did not have a legitimate expectation of privacy and of confidentiality. In these respects, I consider the exposure to Obermayer in Nichols' office no different than the exposure of Nichols' close friends in his home.
>
> . . . Here also the relationship between the participants in the alleged uses evidences a retention of control by Nichols. None of those participants had any basis for inferring that the puzzle was being given over by Nichols for their free and unrestricted use. Holding the public use bar inapplicable in these circumstances will not remove anything from the public domain. Moreover, there is absolutely no evidence in this case of commercially motivated activity by Nichols during the relevant period. Accordingly, the underlying policy against extending the effective term of exclusivity is not offended by a finding that the Nichols invention was not in public use.

544 F. Supp. at 1427 (citations omitted).

CBS correctly recognizes that the district court's conclusion on public use under § 102(b) is subject to review as a question of law while the facts underlying the conclusion on public use are subject to the clearly erroneous standard of review. *Hycor Corp.* v. *Schlueter Co.*, 740 F.2d 1529, 1537, 222 USPQ 553, 559 (Fed. Cir. 1984).

CBS urges that the decision in *Egbert* v. *Lippmann*, 104 U.S. 333 (1881), compels a conclusion of public use in the present case. In *Egbert*, the claimed invention was drawn to improved corset-springs, also called corset-steels. In 1855, the inventor made and presented to his lady friend a pair of corset-steels which embodied

the invention. She wore the steels for a long time. The inventor made and gave her another pair three years later which she also wore a long time. On several occasions, when the corset itself wore out, the steels were removed and placed into a new corset. In 1866, an application for patent was filed. It was on those facts that the Court observed that: "If an inventor, having made his device, gives or sells it to another, to be used by the donee or vendee, without limitation or restriction, or injunction of secrecy, and it is so used, such use is public, even though the use and knowledge of the use may be confined to one person." *Id.* at 336.

The district court distinguished *Egbert* because here Nichols had not given over the invention for free and unrestricted use by another person. Based on the personal relationships and surrounding circumstances, the court found that Nichols at all times retained control over the puzzle's use and the distribution of information concerning it. The court characterized Nichols' use as private and for his own enjoyment. We see neither legal error in the analysis nor clear error in the findings.

As for Obermayer's brief use of the puzzle, the court found that Nichols retained control even though he and Obermayer had not entered into any express confidentiality agreement. The court held, and we agree, that the presence or absence of such an agreement is not determinative of the public use issue. *See TP Laboratories, Inc.* v. *Professional Positioners, Inc.*, 724 F.2d 965, 972, 220 USPQ 577, 583, (Fed. Cir.), *cert. denied*, 105 S.Ct. 108 (1984). It is one factor to be considered in assessing all the evidence. There can be no question that the court looked at the totality of evidence, *see id.* at 971, 220 USPQ at 582; *Hycor Corp.* v. *Schlueter Co.*, 740 F.2d at 1535, 222 USPQ at 557, and evaluated that evidence in view of time, place, and circumstances.

With regard to the question of control, CBS complains that "[t]he record is devoid of any testimony from the friends, associates and fellow workers who saw Nichols cube and to whom its operation was explained." The simple answer is that CBS had the burden at trial to prove public use with facts supported by clear and convincing evidence. *Hycor Corp.* v. *Schlueter Co.*, 740 F.2d at 1536-37, 222 USPQ at 558-59. We think the district court's

characterization of the evidence of record is entirely apt and we see no ground for reversal. Moreover, we agree with the district court that its conclusion on public use is consistent with the policies underlying the bar. *See TP Laboratories*, 724 F.2d at 968, 220 USPQ at 580.

CBS further argues in connection with public use that the district court erred when it found no evidence of commercially motivated activity by Nichols prior to the critical date.[3] Although CBS attempts to paint a picture of commercialization from the discussions between Obermayer and Nichols, we see only the brush strokes of speculation. The record lacks hard evidence. Discussion between employer and employee does not by itself convert an employee's private pursuit into commercial enterprise with the employer. CBS also makes much of a February 6, 1969 phone call by Obermayer to Parker Brothers to see if the latter was interested in receiving a submission of a puzzle idea from an outside inventor. Nothing concerning the nature or workings of Nichols' puzzle was disclosed. Obermayer simply inquired whether and how an outsider could submit a puzzle for Parker Brothers' consideration. We agree with the district court that those facts do not show commercialization. Thus this case differs from other cases where commercial activity was said to violate the policies of section 102(b). *See Kinzenbaw* v. *Deere & Co.*, 741 F.2d 383, 222 USPQ 929 (Fed. Cir. 1984), *cert. denied*, 105 S.Ct. 1357 (1985); *D.L. Auld Co.* v. *Chroma Graphics Corp.*, 714 F.2d 1144, 219 USPQ 13 (Fed. Cir. 1983); *In re Smith*, 714 F.2d 1127, 218 USPQ 976 (Fed. Cir. 1983).

(b) *On Sale*

CBS argues that the claimed invention was on sale within the meaning of 35 U.S.C. § 102(b) because Nichols orally agreed prior to the critical date (e.g., during a January 1969 conversation between Nichols and Obermayer) to assign "all his rights in the puzzle invention" to Moleculon. According to CBS, Nichols not only

[3] In some instances, commercially motivated activities may implicate both the public use and the on sale bars.

assigned the right to apply for a patent on the invention but also conveyed title in his single wooden model.

Although the formal written assignment occurred after the critical date, the district court held that even if there were an earlier oral agreement, an assignment or sale of the rights in the invention and potential patent rights is not a sale of "the invention" within the meaning of section 102(b). We agree. The few cases we have found on this issue have uniformly held that such a sale of patent rights does not come within the section 102(b) bar. *United States Electric Light Co.* v. *Consolidated Electric Light Co.*, 33 F. 869, 870-71 (S.D.N.Y. 1888); *Scott Paper Co.* v. *Moore Business Forms, Inc.*, 594 F.Supp. 1051, 1075 (D. Del. 1984); *see also Federal Sign & Signal Corp.* v. *Bangor Punta Operations, Inc.*, 357 F.Supp. 1222, 1237 (S.D.N.Y. 1973). Such a result comports with the policies underlying the on sale bar, *see Western Marine Electronics, Inc.* v. *Furuno Electric Co.*, 764 F.2d 840, 845, 226 USPQ 334, 337 (Fed. Cir. 1985), and with the business realities ordinarily surrounding a corporation's prosecution of patent applications for inventors, *see Sun Studs, Inc.* v. *Applied Theory Associates, Inc.*, 772 F.2d 1557, 1568, 227 USPQ 81, 89 (Fed. Cir. 1985).

As for CBS' contention that Nichols sold or agreed to sell the wood model of the puzzle, we quote the district court's relevant findings:

> There is no indication in the subsequent written instrument that the parties contemplated the sale or transfer to Moleculon of the single physical embodiment of the puzzle then in existence. Nor is there any other evidence in the record to that effect.

CBS has shown nothing approaching clear error concerning those findings.

Accordingly, we sustain the district court's determination that the claims are not invalid under section 102(b).

2. *Non-obviousness*

CBS argues that the district court erred in holding the subject matter of claims 3-5 and 9 nonobvious under 35 U.S.C. § 103 in light of U.S. Patent No. 3,081,089 issued to Gustafson on March 12, 1963 (Gustafson patent). The parties and the district court agree that the Gustafson patent is the most pertinent prior art. It teaches a "mechanical puzzle having a plurality of varicolored parts which are movable relative to each other to form various patterns." The district court added:

> The puzzle consists basically of a spherical outer shell that rides on a substantially concentric spherical inner core. The outer shell is divided into eight equal parts which are held to the core by tongues that fit into and slide along a series of grooves cut into the core. Groups of four contiguous pieces, viz., hemispheres, may be rotated relative to one another around any of three mutually perpendicular axes.

The court reviewed other references cited by CBS, determined the level of ordinary skill in the art of puzzle design, and thoroughly analyzed the differences between the prior art and the claimed subject matter. CBS does not contest any of the underlying findings but directs its attack on the court's ultimate conclusion of nonobviousness.

As a premise to its argument, CBS says the district court "conceded" that making the puzzle in a cubical embodiment would have been obvious in light of Gustafson's teaching of a spherical design. CBS then asserts that the court improperly relied on unexpected advantages or superiority of the cubical design to overcome obviousness. The premise and argument are flawed. What the court said was that while it would have been obvious to *consider* changing Gustafson's sphere into a cube or other geometric shape, one of ordinary skill in the art would not have recognized the desirability of a subdivided cube capable of tri-axial rotation. The court relied on expert testimony to the effect that Nichols' concept was a breakthrough and represented "a quantum leap from a sphere." The court noted in addition that Gustafson himself

considered other solids which would offer more complexity than the sphere and in his search "dismissed the cube as offering only six faces and went on to work with such larger platonic solids as the octahedron, tetradecahedron, and icosahedron" none of which proved satisfactory.

CBS also argues, citing *In re Durden*, 763 F.2d 1406, 226 USPQ 359 (Fed. Cir. 1985), that method claims 3 through 5 are invalid because they apply an old method (Gustafson) to an obvious object (a cube). It is well worth repeating what we said in *Durden:* "What we or our predecessors may have said in discussing different fact situations is not to be taken as having universal application." 763 F.2d at 1410, 226 USPQ at 361. The issue in *Durden* was "whether a chemical process, otherwise obvious, is patentable *because* either or both the specific starting material employed and the product obtained are novel and unobvious" and that issue was resolved only as a factual matter. Here, the trial court found after reviewing all the evidence of record that nothing in the prior art suggested the combination of a subdivided cube with the rotation of pieces to achieve a preselected pattern. CBS has not shown error in that determination.

In sum, we have considered each of CBS' arguments and the evidence relied upon by the district court, and conclude that CBS has shown neither legal error in the court's determination on nonobviousness nor clear error in the court's probative findings underlying that determination. *Atlas Powder Co.* v. *E.I. DuPont De Nemours & Co.*, 750 F.2d 1569, 1573, 224 USPQ 409, 411 (Fed. Cir. 1984).

3. *Enablement and Utility*

CBS raises related issues of utility under 35 U.S.C. § 101 and enablement under 35 U.S.C. § 112. We review utility as a question of fact and enablement as a question of law. *Raytheon Co.* v. *Roper Corp.*, 724 F.2d 951, 956, 960 n.6, 220 USPQ 592, 596, 599 n.6 (Fed. Cir. 1983), *cert. denied*, 105 S.Ct. 127 (1984); *Cross v. Iizuka*, 753 F.2d 1040, 1044 n.7, 224 USPQ 739, 742 n.7 (Fed. Cir. 1985).

CBS contends that the district court erred in refusing to hold claims 3 through 5 invalid because what the claims define "does not

work – a cube puzzle randomized by rotation about three axes cannot be solved by rotation about just one or two axes." CBS' allegation of inoperativeness relies on a "plain" reading of the claims, i.e., that claim 3 defines a method involving rotation about only *two* axes (step (b)'s "rotating a first set of cube pieces . . . about *a first asix*", step (c)'s "rotating a second set . . . about *a second axis*", and step (d)'s "repeating steps (b) and (c) until the preselected pattern is achieved"); that dependent claim 4 defines rotation about only "one" of three axes; and that dependent claim 5 defines rotation in "multiples of 90°." CBS' argument effectively rests on whether the district court erred in construing the claims. Thus, we must first determine whether the district court erred in interpreting claim 3 as not limited to rotation about only two axes. The court said:

> It is plain from the specifications of the '201 patent that the user is to rotate sets of cube pieces about three axes in order to solve the puzzle. Not only are three axes an inherent feature of the 2x2x2 cube described in the specifications, but there are explicit references to these three axes or the three corresponding coordinate planes in every part of the patent, from the abstract to the drawings. . . .
>
> Claim 3 clearly can be read to contemplate rotation about three axes. By using the indefinite article "a" (i.e. "a first axis," "a second axis"), it is left open to the user, when he comes to the third step, and is directed to repeat the first two steps, to go back to the first axis, or alternatively to select another axis instead, depending upon his solution strategy. This seems to be a reasonable interpretation of the words of the claim, and is clearly consonant with the implications of the rest of the patent and the intent of the patentee.

594 F.Supp. at 1430 (footnote omitted).

The reasoning is sound. This is not a case of a trial court improperly "reading" a limitation found in the specification into the claim. Rather, the trial court correctly ascertained the true

meaning of the claim by interpreting the claim language (e.g., "a first axis," "a second axis") in light of the specification and the patent as a whole.[4] *Loctite Corp.* v. *Ultraseal Ltd.*, 781 F.2d 861, 867, 228 USPQ 90, 93 (Fed. Cir. 1986); *Fromson* v. *Advance Offset Plate, Inc.*, 720 F.2d 1565, 1569-70, 219 USPQ 1137, 1140 (Fed. Cir. 1983). Accordingly, the inoperativeness argument must fail.

CBS also argues that the subject matter of the claims are not "useful" because the claims do not "teach" anyone the complicated method of solving Nichols' or Rubik's puzzle. The argument misperceives the purpose of a claim. The claims are directed to "a method for restoring a preselected pattern." They claim a general *approach* for solving the puzzle. As the district court correctly observed, neither the claims nor the disclosure need set forth *a particular* series of moves to solve the puzzle. Not only do the series of moves for restoring depend on how the preselected pattern was randomized, but there may be more than just one sequence of steps that will restore the preselected pattern. Manifestly, CBS did not come close to meeting the burden of a non-utility defense by proving total incapacity with facts supported by clear and convincing evidence. *See Envirotech Corp.* v. *Al George, Inc.*, 730 F.2d 753, 762, 221 USPQ 473, 480 (Fed. Cir. 1984). Nor has CBS shown that the claims fail for lack of an enabling disclosure, i.e., one that enables a person of ordinary skill in the art to use the claimed methods. *See Atlas Powder Co.* v. *E.I. DuPont De Nemours & Co.*, 750 F.2d 1569, 1576, 224 USPQ 409, 413 (Fed. Cir. 1984).

4. *Infringement*

Literal infringement, i.e., whether properly interpreted claims read on the accused product or method, is a question of fact and reviewable under a "clearly erroneous" standard. *ACS Hospital Systems, Inc.* v. *Montefiore Hospital*, 732 F.2d 1572, 1582, 221

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[4] CBS argues that because claim 1 (disclaimed by Moleculon, *see* note 1 supra) expressly claims rotation about three axes, claim 3 must therefore be more "broadly" claiming rotation about two axes only. The language of dependent claims 4 and 5 are said to support this argument. The district court reviewed the entire patent and concluded otherwise. In our view, the district court's interpretation of the claims is the more reasonable one.

USPQ 929, 936 (Fed. Cir. 1984). Claim interpretation, a threshold inquiry when resolving infringement, is a question of law. *Loctite Corp.* v. *Ultraseal Ltd.*, 781 F.2d 861, 866, 228 USPQ 90, 93 (Fed. Cir. 1986).

First, CBS argues that this court should determine the issue of infringement *de novo* because Moleculon's only witness to testify in regard to the claims disclaimed any expertise in interpreting claims and because Moleculon represented that its experts were not offered for the purpose of applying the claims to the Rubik puzzles. The argument borders on the frivolous. We have never *required* a party to proffer expert testimony on claim interpretation or on application of claim language to accused devices.

Next, CBS faults the district court for not mentioning in its opinion a Citation of Prior Art filed by Moleculon in the U.S. Patent and Trademark Office (PTO). Filed pursuant to 35 U.S.C. § 301[5] one day before Moleculon filed the present suit, the Citation identified the Gustafson patent and distinguished it from the claimed invention. CBS urges that those statements distinguishing Gustafson from the claimed invention also distinguish the Rubik puzzles from the claims in suit. Moleculon answers that the district court did not refer to the Citation because CBS did not argue it to the trial court. In any event, says Moleculon, the statements in the Citation have no limiting effect on the scope of the claims because prosecution history estoppel "has absolutely no application to the facts here" since the statements were not made in order to obtain issuance of claims, nor to amend claims, nor submitted as part of a reexamination proceeding.

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[5] The section provides:

> Any person at any time may cite to the Office in writing prior art consisting of patents or printed publications which that person believes to have a bearing on the patentability of any claim of a particular patent. If the person explains in writing the pertinency and manner of applying such prior art to at least one claim of the patent, the citation of such prior art and the explanation thereof will become a part of the official file of the patent. At the written request of the person citing the prior art, his or her identity will be excluded from the patent file and kept confidential.

Moleculon's contention that prosecution history estoppel has no application in this case does not solve the problem. While it is true that the effect of prosecution history arises as an estoppel when applying infringement analysis under the doctrine of equivalents, *Loctite Corp.* v. *Ultraseal Ltd.*, 781 F.2d at 870, 228 USPQ at 96, the prosecution history can and should, where relevant, be assessed (along with, e.g., claim language and specification) in properly interpreting claim language. *Id.* at 867, 228 USPQ at 93; *Lemelson* v. *United States*, 752 F.2d 1538, 1550, 224 USPQ 526, 532-33) (Fed. Cir. 1985). Thus the question is whether a Citation of Prior Art made by the patentee under section 301 may be considered by the court in interpreting claim language.

The statute plainly says: "[T]he citation of such prior art and the explanation thereof will become a part of the official file of the patent." A citation may be made at "any time" either during prosecution or, as here, after the patent has issued. If made during prosecution, it is clear that the statements may be considered for claim interpretation purposes, just as any other document submitted during prosecution. If submitted after issuance, the answer, again, is it may be considered. To say that it *may* be considered is not to say what *weight* statements in the Citation are to be accorded. For example, a Citation filed during litigation might very well contain merely self-serving statements which likely would be accorded no more weight than testimony of an interested witness or argument of counsel. Issues of evidentiary weight are resolved on the circumstances of each case.

Having considered the statements appearing in Moleculon's Citation, we conclude that they give no additional light to our task of interpreting claims 3-5 and 9 and therefore they will be ignored.

Method Claims 3-5

The district court, in construing method claims 3, 4, and 5 said (emphasis added):

> Claim 3, and its dependent claims, 4 and 5, read on the 2x2x2 form of the puzzle, *as well as on such larger cubic embodiments as the 3x3x3 and the 4x4x4, because*

> *it employs the open transitional phrase "which comprises."* The term "comprising" denotes a patent claim as being "open," meaning that the recitation of structure in the claim is open to additional structural elements not explicitly mentioned.

CBS argues that claim 3 is limited to a method for solving a composite cube of eight cube pieces, i.e., a 2x2x2 puzzle.

Neither party challenges the general proposition that an accused method does not avoid literally infringing a method claim having the transitional phrase "which comprises" (or "comprising") simply because it employs *additional* steps. *See A.B. Dick Co.* v. *Burroughs Corp.*, 713 F.2d 700, 703, 218 USPQ 965, 967 (Fed. Cir. 1983), *cert. denied*, 464 U.S. 1042 (1984). CBS contends, however, that infringement is avoided when a method claim's step is "missing" from the accused method. *E.g., Amstar Corp.* v. *Envirotech Corp.* 730 F.2d 1476 (Fed. Cir.), *cert. denied*, 105 S.Ct. 306 (1984). But here the step is "missing" only in the sense that it is different. CBS says that in solving the 3x3x3 Rubik's Cube or the 4x4x4 Rubik's Revenge there is no step of "engaging *eight cube pieces* as a composite cube" as found in claim 3. Moleculon counters that using the transitional phrase "which comprises" not only opens the claim to additional steps, but also opens the claim and its individual method steps to additional structural elements.[6] Moleculon's statement is far too broad, as an examination of step (a) of claim 3 shows.[7] That step ("engaging eight cube pieces as a composite cube") contains a structural recitation ("eight cube pieces"). The question before us is *not* whether, because of the transitional phrase "which comprises," the step reads on a step of an accused method which recites additional structure (hypothetically, "eight cube pieces and six metal plates"), but rather whether this step which

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[6] Moleculon cites *In re Baxter*, 656 F.2d 679, 210 USPQ 795 (CCPA 1981), and *Swain* v. *Mallory*, 329 F.2d 982, 141 USPQ 209 (CCPA 1964), in support. However, these cases merely support the general proposition that a claim employing the transitional term "comprising" does not exclude additional, unrecited elements (i.e., steps in a method claim).

[7] Since claims 4 and 5 are dependent upon claim 3, our analysis of claim 3 will be illustrative of the three.

recites engaging "eight cube pieces as a composite cube" reads on a step which engages more than eight cube pieces as in the 3x3x3 Rubik's Cube or the 4x4x4 Rubik's Revenge.

The transitional phrase, which joins the preamble of a claim with the body of a claim, is a term of art and as such affects the legal scope of a claim. While a transitional term such as "comprising" or, as in the present case, "which comprises," does not exclude additional unrecited elements, or steps (in the case of a method claim), we conclude that the transitional phrase does not, in the present case, affect the scope of the particular structure recited within the method claim's step.

We note decisions where structural recitation in a method claim step was construed as a limitation on the claim. *See Austin Powder Co.* v. *Atlas Powder Co.*, 568 F.Supp. 1294, 1316 (D. Del. 1983); *Laminex, Inc.* v. *Fritz*, 389 F.Supp. 369, 373-74 (N.D. Ill. 1974). Whether structural recitation limits a claim depends on the language of the claim, the specification, prosecution history, and other claims. The district court erred, therefore, in using the transitional phrase "which comprises" to expand the scope of the recited "eight cube pieces."

Based on our review of the patent, we hold that claim 3 is limited, at least for purposes of literal infringement, to a method for restoring a 2x2x2 composite cube. That interpretation follows not only from the language of step (a), but also from the way the eight cube piece composite cube is manipulated in steps (b), (c), and (d). These steps are limited to manipulating sets of four cubes only.[8]

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[8] During the oral argument, Moleculon argued that the word "comprising" in step (b) ("rotating a first set of cube pieces comprising four cubes about a first axis") means that the step covers four cubes *or more*. "Comprising" is not used here as a transitional phrase and has no special legal effect as such. Hence, it should be interpreted according to the normal rules of claim interpretation. No analogous word precedes the structural recitation of the number of cube pieces in steps (a) and (c). "Comprising" in step (c) reasonably interpreted means "having" but not "having at least."

The district court's erroneous interpretation of claims 3-5 renders clearly erroneous its finding that the method of solving the 3x3x3 Rubik's Cube and 4x4x4 Rubik's Revenge literally infringe those claims. Accordingly, we vacate the finding. The district court made no finding on whether solving the 3x3x3 Rubik's Cube or the 4x4x4 Rubik's Revenge would infringe claims 3-5 under the doctrine of equivalents. The question there is whether the methods for restoring the Rubik's puzzles with their structural differences and the claimed invention perform substantially the same function in substantially the same way to give substantially the same result. *Atlas Powder Co.* v. *E.I. DuPont de Nemours & Co.*, 750 F.2d 1569, 1579, 224 USPQ 409, 416 (Fed. Cir. 1984). On remand the court should address this question. *See Loctite Corp.* v. *Ultraseal Ltd.*, 781 F.2d 861, 869-70, 228 USPQ 90, 95-96 (Fed. Cir. 1986).

CBS appears to argue, as it did below, that even its 2x2x2 pocket cubes do not literally infringe the method claims because the pocket cubes are not composite cubes consisting of "eight cube pieces" but instead are partial cubes whose internal faces are cut away to accommodate an internal engaging mechanism. We reject the argument. The Nichols patent as a whole shows that the word "cube" is not limited to geometrically true cubes but refers to the cubelet shape as perceived by the puzzle user.

One more issue remains. Method claims 3-5 can be infringed only by a puzzle user. Thus, Moleculon's claim is one for inducing infringement under 35 U.S.C. § 271(b).[9] CBS argues that it cannot be liable for inducing infringement of claims 3-5 because there is no evidence of direct infringement of the method claims. The district court held that Moleculon had met its burden of showing infringement under section 271(b) with circumstantial evidence of extensive puzzle sales, dissemination of an instruction sheet teaching the method of restoring the preselected pattern with each puzzle, and the availability of a solution booklet on how to solve the puzzle.

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[9] 35 U.S.C. § 271(b) provides: "Whoever actively induces infringement of a patent shall be liable as an infringer." The parties and the district court on occasion use the term "contributory infringement." So as not to confuse the case here, which concerns inducing infringement, with "contributory" infringement under § 271(c), we will consistently use the language of § 271(b).

If CBS is arguing that proof of inducing infringement or direct infringement requires *direct*, as opposed to *circumstantial evidence*, we must disagree. It is hornbook law that direct evidence of a fact is not necessary. "Circumstantial evidence is not only sufficient, but may also be more certain, satisfying and persuasive than direct evidence." *Michalie* v. *Cleveland Tankers, Inc.*, 364 U.S. 325, 330 (1960). We see no clear error in the court's finding of infringement under section 271(b) with regard to the 2x2x2 pocket cube versions.

Claim 9

Moleculon acknowledged during trial and the district court held that claim 9 was limited to a 2x2x2 puzzle form. The question presented to the court was whether Rubik's 2x2x2 pocket cubes infringed the claim. The district court found that each of the pocket cubes literally infringed claim 9. Of the three claim interpretation arguments presented to and rejected by the lower court, only one is raised on appeal – namely, that neither of Rubik's pocket cubes infringes claim 9 because the pocket cubes' pieces are not "releasably" maintained in a composite cube. According to CBS, "releasably" maintained means capable of disengagement or separation during normal puzzle manipulation, as would be possible for Nichols' embodiment using magnets to hold the cubelets together.

The district court determined that "in the context of the patent as a whole, it is far more reasonable to read the phrase 'releasably maintaining' as referring to a means of holding the puzzle pieces in assembled relationship while permitting relative rotation of groups of pieces." We agree. As noted by the court, the '201 patent's specification states that "the invention includes such devices wherein the engagement is provided by mechanical or magnetic means providing structural integrity without restriction of rotational freedom . . . " Further, in the patent's "Description of Preferred Embodiment" it is pointed out that while disengagement is an inherent feature of magnetically-engaged cubes "it is also possible to achieve engagement by mechanical rather than magnetic means, as for example by using a pop-in snap linkage, or

a tongue-in-groove arrangement allowing rotation without disengagement."

We see no error in the court's claim interpretation. Accordingly, we affirm the finding of infringement as to claim 9.

5. *Conclusion*

Those parts of the district court's judgment holding that the claimed invention was not in public use or on sale, that claims 3-5 are not invalid for lack of utility or enablement, and that claims 3-5 and 9 are not invalid for obviousness, are *affirmed.*

That part of the judgment holding the '201 patent infringed by the 3x3x3 Rubik's Cube and 4x4x4 Rubik's Revenge is *vacated and remanded* for proceedings consistent with this opinion.

That part of the judgment holding claims 3-5 and 9 infringed by the 2x2x2 Rubik's pocket cubes is affirmed,

AFFIRMED IN PART, VACATED IN PART, AND REMANDED

ORDER DATED OCTOBER 2, 1984

United States District Court
D. Delaware.

MOLECULON RESEARCH CORPORATION,

Plaintiff,

v.

CBS, INC.

Defendant.

Civ. A. No. 82-289-WKS.

An action was filed for patent infringement by the assignee of the inventor of a cube puzzle. The District Court, Stapleton, Chief Judge, held that: (1) patent No. 3,655,201 was not invalid on the basis of "public use" or being "on sale" more than one year prior to the patent application; (2) claims 3, 4 and 5 of the patent involving methods for solving the puzzle were not invalid for lack of utility; (3) claim 6 of the patent was invalid for obviousness; (4) four other claims were not invalid for obviousness; (5) the nonobvious claims were infringed; and (6) the defendant was liable for contributory infringement of the claims involving the method of solving the puzzle.

Order accordingly.

OPINION

STAPLETON, Chief Judge:

This is an action for patent infringement brought by the plaintiff, Moleculon Research Corporation ("Moleculon"), as assignee of U.S. Letters Patent No. 3,655,201 ("the '201 patent") from Larry D. Nichols, the inventor. Moleculon charges the defendant, CBS, Inc. ("CBS"), as the successor to the Ideal Toy Corporation ("Ideal"), with infringement of Claims 3, 4, 5, 6 and 9 of the '201 patent. The subject of the '201 patent, in its preferred embodiment, is a cube puzzle composed of eight smaller cublets that may be rotated in groups of four adjacent cubes, and a method by which the sets of cubes may be rotated, first to randomize, and then to restore a predetermined pattern on the six faces of the composite cube.

The issues relating to damages and other possible relief were severed and a trial was held on the issues of validity and infringement. This opinion constitutes my findings of fact and conclusions of law with respect to validity and infringement.

I. THE BACKGROUND FACTS

Nichols' interest in puzzles began at the age of five or six. His interest in the familiar "Sam Loyd 15" puzzle[1] evolved into a desire to improve on what he perceived to be its shortcomings. In particular he, considered various ways of eliminating the empty space, while allowing pieces to be moved.

During an evening stroll in the Summer of 1957, these thoughts and ideas suddenly fell into place in Nichols' mind and he conceived of a three-dimensional puzzle capable of rotational movement. Nichols quickly envisioned an assembly of eight cubes

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[1] The Sam Loyd 15 puzzle, invented in 1873, is the familiar square, two dimensional puzzle inset with fifteen flat square numbered tiles and an empty space that could accommodate a sixteenth tile. The tiles can be moved one at a time by sliding them into the empty space.

stacked in a 2x2x2 arrangement, with each of the six faces of the composite cube distinguished by a different color. He recognized that the smaller cubes would be rotated in sets of four around one of three mutually perpendicular axes. He felt immediate satisfaction at having arrived at this concept.

Nichols very quickly realized that magnets could be used to hold the cubes in assembled form yet allow rotational movement. His efforts to conceive of a feasible mechanical means of assembly proved more difficult; however, by the Fall of 1957, Nichols believed that a double tongue-in-groove arrangement could be made to work.

During the period 1957-1968, Nichols constructed several momdels of his puzzle, making cubes of heavy file-card type paper and affixing small magnets to the inside of the small clubes. These models confirmed the feasibility of Nichols' conception, but lacked durability. During this period he also attempted to explore mechanical alternatives, such as engaging the cubes through a tab-and-slot arrangement, but these experiments were not satisfactory.

Nichols spent the years 1959-62 as a graduate student in organic chemistry at Harvard. During this period, a few close friends, including two roommates and a colleague in the Chemistry Department, had occasion to see one of these paper models in Nichols' room and Nichols explained its operation to at least one of them.

In 1962, after completing the requirements for a Ph.D. in organic chemistry, Nichols accepted employment as a research scientist at Moleculon. In 1968, Nichols happened upon some small, strong and relatively inexpensive magnets in a retail store. Realizing that he now had access to machining equipment at work, he undertook to make a wood block prototype of his puzzle. Working after working hours, he drilled holes in the internal faces of eight small wooden blocks, inserted the magnets, properly oriented them, and glued them in. He then painted each of the six faces of the composite cube a different color. To his satisfaction, it held together nicely.

Nichols usually kept the puzzle at home, but on occasion brought it to his office to work on it or to play with it. In early January of 1969, Dr. Obermayer, the president of Moleculon, entered Nichols' office and happened to see the model sitting on his desk. He immediately expressed an interest in the puzzle, and in response, Nichols explained its workings. He asked to take it home and was given permission to do so. Obermayer asked whether Nichols intended to commercialize the puzzle. When Nichols answered in the negative, Obermayer suggested that Moleculon attempt to do so and Nichols expressed general agreement. In March of 1969, Nichols signed a written agreement assigning all his rights in the puzzle invention to Moleculon in return for a share of any proceeds of commercialization. Moleculon in turn assumed all expenses of commercializing the puzzle.

Shortly thereafter Moleculon undertook an extensive effort to commercialize the puzzle. Obermayer called Parker Brothers in February of 1969 to determine whether they had an interest in receiving for consideration puzzle ideas from outside inventors and, if so, how one should go about making a submission. Parker Brothers responded with a letter and booklet describing their general practice regarding puzzle and game submissions and on March 7, 1969, Moleculon sent Parker Brothers an actual model and a description of the cube puzzle. During the subsequent three year period, Moleculon contacted between fifty and sixty toy and game manufacturers. Among those contacted was Ideal. Moleculon sent Ideal only a generalized, non-specific description of the puzzle, and Ideal responded to the effect that it did not currently have an interest in marketing the puzzle. In fact, Moleculon did not succeed in marketing the Nichols cube.

Toward the end of 1969, Nichols began working on a patent application for his puzzle. After several drafts were exchanged between Nichols and his attorney, a patent application was filed on behalf of Moleculon on March 3, 1970. On April 11, 1972, the '201 patent covering Nichols' invention was issued.

In February or March of 1981, Obermayer first became aware of Ideal's Rubik's Cube through items in the press. Shortly thereafter, he purchased a Rubik's cube. Struck by the similarity to

the Nichols' cube, Obermayer wrote to the president of Ideal calling his attention to the '201 patent. Ideal, through its patent attorney, responded that it had studied the prior art and believed that Rubik's Cube did not infringe any valid patent claims. In August 1981, Obermayer met with Ideal's chairman to discuss the possibility of Ideal licensing the '201 patent. At that meeting, Obermayer was given a copy of U.S. Letters Patent No. 3,081,089 issued to Gustafson on March 12, 1963 ("the Gustafson Patent"). When subsequent meetings between counsel for Moleculon and Ideal failed to produce an agreement, this suit was instituted. During the pendency of this litigation, Ideal was acquired by CBS.

It is not claimed that Ideal was aware of or in any way derived its Rubik's Cube from the '201 patent. On the contrary, the Rubik's Cube was first brought to Ideal's attention by an inventor's agent from England. Captivated by the puzzle, Ideal executives concluded a licensing agreement with the Hungarian state agency, Konsumex, and in February 1980, the Rubik's Cube was introduced to the trade at the International Toy Fair in New York City. The Rubik's Cube was patented in Hungary, but was marketed by Ideal in the United States without seeking the benefit of patent protection over the cube puzzle itself. Ideal did, however, obtain trademark protection for the "Rubik" name and certain of the internal mechanisms were patented.

II. THE PRESUMPTION OF VALIDITY

[1] The '201 patent is presumed valid pursuant to 35 U.S.C. § 282. This presumption may be overcome only by evidence which demonstrates invalidity clearly and convincingly. Moreover, the Court of Appeals for the Federal Circuit has recently held that the presumption of validity is neither weakened nor destroyed by pertinent prior art not considered by the Patent and Trademark Office ("PTO"), and that 35 U.S.C. § 282 requires a court to presume that the patent is useful, novel and nonobvious as well as not subject to a statutory bar. *Medtronic, Inc. v. Cardiac Pacemakers, Inc.*, 721 F.2d 1563, 220 U.S.P.Q. 97 (Fed. Cir. 1983); *Leinoff v. Louis Milona and Sons, Inc.*, 726 F.2d 734, at 738 (Fed. Cir. 1984)

citing *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1534, 218 U.S.P.Q. 871 (Fed. Cir. 1983); *TP Laboratories v. Professional Positioners*, 724 F.2d 965 (Fed. Cir. 1984).

III. SECTION 102(b) BARS

The first defense raised by CBS is that the '201 patent is invalid because the Nichols cube puzzle was in public use and on sale more than one year prior to the date of the U.S. patent application. Section 102(b) provides in pertinent part that "[a] person shall be entitled to a patent unless—

> the invention was . . . in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States."

[2] The "public use" and "on sale" bars are two different defenses that must be considered separately; however, a determination of when the Nichols invention was reduced to practice is necessary in either case. The Section 102(b) bars come into play only after the invention has been reduced to practice: "[A]n invention cannot be offered for sale until it is completed, which requires not merely its conception but its reduction to practice." *Barmag Barmer Maschinenfabrik AG v. Murata Machinery, LTD*, 731 F.2d 831, 838 (Fed. Cir. 1984), citing *Timely Products Corp. v. Arron*, 523 F.2d 288, 302 (2d Cir. 1975). This means that the complete invention, as reflected in the patent claims, must have been embodied in, or obvious in light of, the thing whose use or sale is said to come within Section 102(b).

[3,4] Reduction to practice is not, however, to be equated with commercial marketability. In fact, "it is immaterial that the device was a makeshift or 'Rube Goldberg' embodiment" so long as any modifications made along the road to commercial marketability do not involve limitations in the claims. *Barmag, supra* at 838. In light of these principles, I conclude that the early paper-and-magnet models constructed by Nichols while a graduate student at Harvard constituted a reduction to practice. The fact that they lacked durability and were clearly makeshift does not alter the fact that the device was plainly functional for its intended purpose.

[5] Moleculon urges that a reduction to practice occurred only when Nichols constructed his first wooden block-and-magnet model in 1968. That position is clearly inconsistent with the law as enunciated in the *Barmag* case, however, since this change in materials is in no way reflected in the ultimate patent claims. Moleculon adds by way of footnote in its post-trial reply brief that "[e]ven if the Harvard paper models constituted a reduction to practice, they were obviously experimental and cannot form the basis of a public use." [R.B. 5]. However, experimentation in the sense of refinement, occurring after a reduction to practice, does not preclude the applicability of Section 102(b). *In re Smith*, 714 F.2d 1127 (Fed.Cir.1983).

A. "Public Use"

During the years 1959 to 1962, while Nichols was a graduate student at Harvard University, several persons had occasion to see one or more of Nichols' paper models as he was working or playing with them. Two of these persons were roommates of Nichols, another was a colleague in the Chemistry Department, and there may have been "one or two others." Nichols recalls having explained the intended operation of the puzzle to his roommate, Leon Levy, and he testified at trial that he had probably explained it to others "in response to their asking . . . what in the world . . . [he] was doing." All who may have seen the model were intimate friends of Nichols and he would have been "astonished if any of them had felt free to do something with . . . the idea . . . ." (Tr. 897). However, Nichols testified that he relied on their friendship rather than exacting an explicit promise of secrecy.

After Nichols constructed the wooden block puzzle in 1968, he kept it primarily in his home, open to view by house guests. Nichols "made [no] effort to bring it to anyone's attention," but "[i]t was no secret to those who happened to encounter it." Moreover, he did not hesitate to explain the workings of the puzzle when asked to do so.

From time to time, Nichols took the puzzle to work at Moleculon, either to use various tools to work on it or to play with it during free moments. It was on one of these occasions that Obermayer noticed the puzzle on Nichols' desk. It may also have

been seen by a few other Moleculon employees in Nichols' office. Moleculon did confidential work for the government and its offices were not open to the public in the regular course of its business. Moleculon employees had received security clearances from the government and had signed confidentiality agreements with respect to information obtained in the course of their work.

The issue is whether on the basis of these facts, the Nichols invention was "in public use" within the meaning of Section 102(b) more than one year before the date that the United States patent application was filed. Since that date was March 4, 1970, the critical date for purposes of Section 102(b) is March 4, 1969.

[6] Moleculon urges that even if the paper cube and magnet model is found to represent a reduction to practice, the activity that occurred prior to construction of the wooden cube model was, in any event, within the "experimental use" exception. It is well established that "use of an invention by the inventor himself, or of any other person under his direction, by way of experiment, and in order to bring the invention to perfection, has never been regarded as such a [public] use." Such testing need not be carried out in secrecy or behind locked doors in order to avoid becoming public use. *City of Elizabeth v. American Nicholson Pavement Co.*, 97 U.S. 126, 24 L.Ed. 1000 (1877); *TP Laboratories v. Professional Positioners*, 724 F.2d 965 (Fed. Cir. 1984).

On the other hand, not everything that can be characterized as experimentation prevents a use from being a "public use." "It is settled law that the experimental use exception is not applicable to experiments performed with respect to unclaimed features of an invention." *In re Smith*, 714 F.2d 1127, 1136 (Fed.Cir.1983). "[T]he rule is that an invention is deemed functional for public use purposes when it can perform the general function for which it has been developed, even though the device might later be refined." *Id. quoting Atlas v. Eastern Airlines, Inc.*, 311 F.2d 156, 160 (1st Cir. 1962).

Nichols' efforts during the years 1959-62 appear to have been devoted largely to refinement of the physical embodiment of the puzzle although he also directed some effort toward developing

a mechanical means of assembly. Neither of these lines of experimentation, however, resulted in any limitations in the ultimate patent claims. Finally, Nichols certainly spent time engrossed in the puzzle aspects of his invention, but again, this could not accurately be characterized as experimental use as delineated in the caselaw.

While I agree with CBS that there was no experimental use after 1959, I nevertheless conclude that the Nichols invention was not "in public use" prior to March 4, 1969. The "public use" and "on sale" bars should be applied with a view toward furthering the underlying policies. In *Philco Corp. v. Admiral Corp.*, 199 F.Supp. 797, 815 (D.Del.1961). Judge Wright pointed out the problems engendered by attempts to apply hard and fast legal rules to the multitude of factual variations that arise and the importance of keeping in mind the policies underlying Section 102(b). In *Barmag Barmer Maschinenfabrik AG v. Murata Machinery, LTD*, 731 F.2d 831, 837 (Fed.Cir.1984), the Federal Circuit indicated that these policies "in effect, define the terms of [section 102(b)]."

The courts have identified four policies underlying Section 102(b). "Operating against the inventor are the policies of (1) protecting the public in its use of the invention where such use began prior to the filing of the application, (2) encouraging prompt disclosure of new and useful information, (3) discouraging attempts to extend the length of the period of protection by not allowing the inventor to reap the benefits for more than one year prior to the filing of the application. In contrast to these considerations, the public interest is also deemed to be served by (4) allowing an inventor time to perfect his invention, by public testing if desired, and to prepare a patent application." *TP Laboratories, supra* at 968.

In general, the courts have construed the public use bar very broadly. In the classic case of *Egbert v. Lippman*, 104 U.S. 333, 26 L.Ed. 755 (1881), for example, the inventor made and gave a single set of steel corset stays to his mistress. She used them in a series of corsets over a period of eleven years. The Supreme Court held that this was public use within the meaning of the statute because the invention had been given over for free and unrestricted use by a person other than the inventor: "If an inventor, having made his

device, gives or sells it to another, to be used by the donee or vendee, without limitation or restriction, or injunction of secrecy, and it is so used, such use is public within the meaning of the statute, even though the use and knowledge of the use may be confined to one person." Thus, public use need not be commercial in nature, and need not occur "out in public" as that term is usually understood. For an invention to be in public use, on the other hand, it must be made available to someone else without restriction in its ordinary form or mode of operation.

[7] In its post-trial answering brief, CBS argues that a "single use of an invention without restriction or limitation by even one person who is not an agent of the inventor is sufficient to constitute 'public use' . . . ". That appears to be an accurate statement of the law; however, it is not an apt characterization of what occurred here. The essence of "public use" is the free and unrestricted giving over of an invention to a member of the public or the public in general. What I see here, by contrast, is the inventor's private use of his own invention for his own enjoyment. "Private use of one's own invention is permissible." *Bergstrom v. Sears, Roebuck and Co.*, 457 F.Supp. 213, 224 (D.Minn.1978).[2] "[A]n inventor may continue for more than a year to practice his invention for his private purposes or his own enjoyment and later patent it." *Id.*, *quoting Metallizing Engineer Co. v. Kenyon Bearing & A.P. Co.*, 153 F.2d 516, 520 (2d Cir.1946), *cert. denied*, 328 U.S. 840, 66 S.Ct. 1016, 90] L.Ed. 1615 (1946).

[8] While it is true that Nichols explained his puzzle to a few close colleagues who inquired about it and allowed Obermayer to in fact use it, the personal relationships and other surrounding

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[2] In *Bergstrom*, the inventor placed his invention, a fireplace grate, in his family room. Only members of the family, children of friends, and adult guests were admitted to the room, and there was no evidence to suggest that anyone "either understood its significance or were able to convey visual observation of the grate to the public domain." *Bergstrom* at 224. Accordingly, the court held that the inventor did not place the invention in anyone's hand prior to the critical date.

circumstances were such that Nichols at all times retained control over its use as well as over the distribution of information concerning it. He never used the puzzle or permitted it used in a place or at a time when he did not have a legitimate expectation of privacy and of confidentiality. In these respects, I consider the exposure to Obermayer in Nichols' office no different than the exposure of Nichols' close friends in his home.

The fact that each person to whom the puzzle was demonstrated was not expressly sworn to secrecy is not determinative of, or even highly relevant to, the public use issue. The Court of Appeals for the Federal Circuit has recently noted that the importance of an express confidentiality agreement lies primarily in the fact that it is an indicator of the inventor's retention of control over the use of his invention. In *TP Laboratories, supra* at 972, the court said that "a pledge of confidentiality is indicative of the inventor's continued control which is here established inherently by the dentist-patient relationship of the parties." Here also the relationship between the participants in the alleged uses evidences a retention of control by Nichols. None of those participants had any basis for inferring that the puzzle was being given over by Nichols for their free and unrestricted use. Holding the public use bar inapplicable in these circumstances will not remove anything from the public domain. Moreover, there is absolutely no evidence in this case of commercially motivated activity by Nichols during the relevant period. Accordingly, the underlying policy against extending the effective term of exclusivity is not offended by a finding that the Nichols invention was not in public use.

B. "On Sale"

The formal written assignment to Moleculon of all rights to the Nichols invention is dated March 6, 1969, and thus occurred within the one-year grace period. That agreement "sells, assigns and transfers to Moleculon [Nichols'] entire right, title and interest in and to said TWIST PUZZLE invention together with the right to apply for Letters Patent of the United States and all other countries covering said invention." [DX-6]. CBS argues, however, that the Nichols invention was "on sale" prior to the critical date of March

4, 1969 by virtue of the negotiations between Nichols and Obermayer in January of 1969.

[9] It is far from clear that what occurred in January of 1969 can fairly be characterized as an agreement or offer to assign Nichols' rights in his invention to his employer. Assuming for present purposes, however, that Nichols did agree in January of 1969 to assign to Moleculon any inchoate patent rights present in his puzzle, I nevertheless conclude that such a transaction does not fall within the "on sale" bar of Section 102(b) because only potential patent rights and not a device embodying the invention was involved.

[10] There is no indication in the subsequent written instrument that the parties contemplated the sale or transfer to Moleculon of the single physical embodiment of the puzzle then in existence. Nor is there any other evidence in the record to that effect. The single issue to be decided, then, is whether an assignment or sale of the potential patent rights to an invention is a sale of "the invention" within the meaning of Section 102(b).

Considering that the assignment of patent rights, both before and after issuance of the patent, is clearly not a novel transaction, there is surprisingly little case law that squarely addresses the issue. What authority there is, however, indicates that Section 102(b) restricts only the sale of the physical embodiment of the invention and not the transfer of rights to a prospective patent covering the invention. In fact, this appears to be a long-established principle of hornbook law. Back in 1936, for example, the following rule was stated in C. Rivise & A. Caesar, *Patentability and Validity* § 284 at 526-7 (1936):

> The statute refers to the invention being on sale, but obviously *the device of the invention* and not *the right to patent protection* is meant. For this reason, the Court in *United States Electric Lighting Co. v. Consolidated Electric Light Co.*, 33 Fed.Rep. 869 (S.D.N.Y. 1888) refused to invalidate Patent No. 306,980 for a method of manufacturing carbon conductors for incandescent lamps, though it appeared that the inventor more than two years prior to the filing of his patent application had assigned his patent rights to the plaintiff.

(Emphasis in original). Similarly, *Deller's Walker on Patents* states that "[a]n assignment of the right to secure a patent is not placing the invention on sale." Section 147, at 713 (2d ed. 1964).

On the other hand, I have been unable to find any case holding that the assignment or transfer of potential patent rights, without more, constitutes a sale of the invention within the meaning of Section 102(b). None of the cases cited by the defendant stands for that proposition.

In *Kock v. Quaker Oats Co.*, 681 F.2d 649 (9th Cir.1982), *cert. denied*, 459 U.S. 1147, 103 S.Ct. 787, 74 L.Ed.2d 994 (1983), the court undertook a detailed exposition of the so-called "experimental purpose exception" to the on-sale bar. That aspect of the case is clearly inapplicable here. More important, however, there was a clear sale and delivery of a prototype toy embodying the invention. In *Kock*, the original agreement was for the development and building of a prototype toy meeting certain specifications. Thereafter, the inventor and the toy company entered into an agreement selling the toy and assigning all rights to any invention embodied therein to the toy company. The court had no occasion to consider the significance of an assignment of inchoate patent rights absent a sale of the device.

Nor does *Manufacturing Research Corp. v. Graybar Elec. Co.*, 679 F.2d 1355 (11th Cir.1982) lend support to the position urged by the defendant. That case involved both a licensing agreement and an offer to sell the device itself, and the court did not focus on the effect of the licensing agreement alone. In finding that the device had been placed on sale prior to the critical date, the court held that "uncontroverted evidence establishes beyond doubt that [the first inventor] had sold such a device to [a manufacturer] [prior to the critical date]." *Id.* at 1361.

When an inventor assigns his rights in his invention to another, he simply places someone else in his shoes. For this reason, I perceive no reason why such a transaction should trigger the running of the one year grace period. Accordingly, I decline to hold that Nichols' invention was "on sale" in January of 1969.

The defendant further argues that Obermayer's contacts with Parker Brothers in February of 1969 constitute an invalidating offer to sell within the meaning of Section 102(b). Although it is settled law that offers to sell fall within the "on sale" bar, *Chicopee Manufacturing Corp. v. Columbus Fiber Mills Co.*, 165 F.Supp. 307 (M.D. Ga.1958); *Timely Prods. Corp. v. Arron*, 523 F.2d 288 (2d Cir.1975), I do not believe that anything that occurred prior to March 4, 1969 can fairly be characterized as an offer to sell the invention.

[11] On February 6, 1969, Obermayer telephoned Parker Brothers to determine whether they were interested in receiving a submission of a puzzle idea from an outside inventor. Nothing concerning the nature or workings of the Nichols puzzle was disclosed. Obermayer did not offer to sell anything; he merely inquired, in effect, whether offers from outsiders were considered by Parker Brothers and, if so, how one should be made. It was not until March 7, 1969, after the critical date, that Moleculon submitted detailed information concerning the puzzle for consideration by Parker Brothers.

IV. THE UTILITY OF CLAIMS 3, 4, AND 5

[12] Section 1.01 of the Patent Act authorizes the grant of a patent for "any new and *useful* process, machine, manufacture or composition of matter or any new and *useful* improvement thereof. . . . " (emphasis added). To meet the utility requirement thus imposed an invention must satisfy the following three tests: 1) it must be operable and capable of use, i.e., it must perform its designated function; 2) it must achieve "some minimum human purpose"; and 3) the purpose achieved must not be illegal, immoral, or contrary to public policy. 1 D. Chisum, *Patents* ¶ 4.01, 4-2 (1984).

Claims 3, 4, and 5 of the '201 patent read as follows:

> 3. A method for restoring a preselected pattern from sets of pieces which pieces have constantly exposed and constantly non-exposed surfaces, the exposed surfaces adapted to be combined to form the preselected pattern, which sets when in random engagement fail to display said preselected pattern which comprises:

A. engaging eight cube pieces as a composite cube;

b. rotating a first set of cube pieces comprising four cubes about a first axis;

c. rotating a second set of four cubes about a second axis; and

d. repeating steps (b) and (c) until the preselected pattern is achieved.

4. The method of claim 3 which includes rotating sets of cubes about one of three mutually perpendicular axes with reference to the composite structure.

5. The method of claim 3 wherein the sets of cubes are rotated through multiples of 90°.

CBS urges that these claims are invalid because they are inoperable.

[13] Claim 3 is a method claim covering "[a] method for restoring a preselected pattern" after the puzzle has been randomized. It prescribes the general method of rotation to be used in attempting to solve the puzzle. CBS argues that this method calls for rotation of only *two* sets of pieces around only *two* axes, and, hence, is inoperable because a puzzle randomized or scrambled by rotation about three mutually perpendicular axes cannot be solved by rotation about only two axes. Claims 4 and 5 are dependent claims, and therefore, it is contended, incorporate the fatal defect of Claim 3.

CBS argues that pursuant to the text of Claim 3, the puzzle user, in order to carry out step (d), must go back and rorate precisely the same set of cubes around precisely the same axis as chosen in step (b), proceeding then to precisely the set and precisely the axis chosen in step (c), and so on, and so on. CBS seeks to bolster this argument by explaining the wording as a reference to a two-dimensional puzzle included in the original patent application and

subsequently dropped. I do not find that line of reasoning persuasive. The original patent application had eight device claims and a single method claim. That method claim was clearly intended to cover the cube puzzle with its three axes, as well as the flat embodiment with four axes that was later deleted. Moreover, it makes no sense to explain the alleged reference to two axes and two only, as an erroneous throw-back to a puzzle that itself had four axes. The draftsman of the patent application might well have chosen other, less ambiguous language; I believe, however, that he intended to use the words he did and that he understood them to allow for rotation around all three axes at some point in the solution of the cube puzzle.

The law does not require a rigidly literal reading of claim language. Rather, "if the claim [is] fairly susceptible of two constructions, that should be adopted which will secure to the patentee his actual invention, rather than to adopt a construction fatal to the grant." *Smith v. Snow*, 294 U.S. 1, 14, 55 S.Ct. 279, 284, 79 L.Ed. 721 (1938). Similarly, in *United States v. Adams*, 383 U.S. 39, 49, 86 S.Ct. 708, 713, 15 L.Ed.2d 572 (1966), the Court stated that "it is fundamental that claims are to be construed in the light of the specifications and both are to be read with a view to ascertaining the invention." In *Adams*, the Court looked to the specifications to determine the ends sought to be achieved by the contested patent. The Court concluded that the intent to employ a water electrolyte was obvious in light of the specifications, despite the failure to refer to any electrolyte in certain claims, and was plainly "not the after-thought of an astute patent trial lawyer." *Id.* at 49, 86 S.Ct. at 713.

It is plain from the specifications of the '201 patent that the user is to rotate sets of cube pieces about three axes in order to solve the puzzle. Not only are three axes an inherent feature of the 2x2x2 cube described in the specifications, but there are explicit references to these three axes or the three corresponding coordinate planes in every part of the patent, from the abstract to the drawings. Accordingly, the text of Claim 3 should not be construed as limited to rotation about two axes unless it permits of no other construction.

Claim 3 clearly can be read to contemplate rotation about three axes. By using the indefinite article "a" (i.e., "*a* first axis," "*a* second axis"), it is left open to the user, when he comes to the third step, and is directed to repeat the first two steps, to go back to *the* first axis, or alternatively to select another axis instead, depending upon his solution strategy. This seems to be a reasonable interpretation of the words of the claim, and is clearly consonant with the implications of the rest of the patent and the intent of the patentee.[3]

It is further urged that the method Claims 3, 4, and 5 are not a useful or an enabling disclosure, in the sense of teaching anyone a method for solving the puzzle. Nor, it is alleged, is such a method of solution set out anywhere else in the patent. While the allegations are true, they are irrelevant. The object of a puzzle is to challenge the wits of the user and the puzzle isn't designed to carry out one particular "correct" series of moves. The solution is the converse of whatever sequence of steps is used to scramble the puzzle on a particular occasion. It is interesting to note in this regard that the Rubik's Cube puzzle is sold by Ideal with an instruction insert that describes little beyond the general method of scrambling the cube. The user is then instructed to "Return all 6 sides to their original solid colors." If CBS' argument is correct, Ideal has been selling a useless item.

There is a strong presumption that an issued patent has utility, since utility is one of the basic criteria for patentability. Accordingly, this presumption can only be overcome by clear and convincing evidence to the contrary. Ambiguous claim language, where such language can be read a easily to uphold the patent as to strike it down simply fails to reach the required level of proof to support a finding of invalidity. Moreover, it is axiomatic that claims are to be read in light of the specifications and with an eye to ascertaining

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[3] It is true that when one so construes Claim 3, it is difficult to understand why Claims 4 and 5 were included since three mutually perpendicular axes and ninety degree turns are inherent in the cube puzzle described in Claim 3 and its solution. The fact that Claims 3, 4 and 5 may be coterminus, however, does not tender them invalid. It is further clear that Claim 4, being dependent, could not have been intended to broaden Claim 3 limited to rotations about two axes only.

the meaning of the patent. Bearing in mind the foregoing principles, I conclude that Claims 3, 4, and 5 of the '201 patent are not invalid for lack of utility.

V. ANTICIPATION

[14, 15] To be patentable, an invention must be new at the time of its discovery by an original inventor. This novelty requirement is one of the essential prerequisites of patentability. 35 U.S.C. § 102. The test for lack of novelty, i.e., anticipation, is one of strict identity. "To anticipate a claim, a prior art reference must show each and every element claimed." *General Electric v. United States*, 215 Ct.Cl. 636, 572 F.2d 745, 768 (1978); *Leinoff v. Milona & Sons, Inc.*, 726 F.2d 734, 738 (Fed.Cir.1984). Anticipation will be found only if "all elements of a claimed invention arranged as in the claim" can be found in a single prior art reference. *Connell v. Sears, Roebuck & Company*, 722 F.2d 1542, 1548 (Fed.Cir.1983). Since the requisite degree of identity is rarely found, anticipation has been termed a "technical defense." *Shaw v. E.B. & A.C. Whiting Co.*, 417 F.2d 1097 (2d Cir.1969); *Walker v. General Motors Corp.*, 362 F.2d 56, 58 (9th Cir. 1966).

[16] CBS contends that Claims 1 and 6 of the '201 patent are invalid under 35 U.S.C. § 102 because they are anticipated by the Gustafson patent. Since Claims 1 and 2 were formally disclaimed by Moleculon on April 19, 1983 it is necessary to consider only the validity of Claim 6.

Anticipation is to be determined by reference to the claim language of the patent whose validity is in question. Expressed another way, anticipation is determined by whether claim "reads on" the prior invention or reference. If every element of Claim 6 of the § 201 patent can be found in the Gustafson puzzle, then that claim is anticipated and therefore invalid. Claim 6 of the '201 patent reads as follows:

> 6. A puzzle comprising at least eight pieces, visually distinguishable indicia on at least one face of each piece with the eight pieces together having at least two visually distinct indicia, means associated with each of the remaining faces only of each of the pieces releasably

> maintaining the pieces in assembled relationship forming a composite structure, said maintaining means enabling three interaffiliated groups of four contiguous pieces each to be rotated respectively about three mutually perpendicular axes, the two distinct indicia being so located on the respective pieces that the groups can be rotated to effect the display of at lest two distinct indicia of the composite structure.

The Gustafson patent teaches a "mechanical puzzle having a plurality of varicolored parts which are movable relative to each other to form various patterns." The puzzle consists basically of a spherical outer shell that rides on a substantially concentric spherical inner core. The outer shell is divided into eight equal parts which are held to the core by tongues that fit into and slide along a series of grooves cut into the core. Groups of four contiguous pieces, viz., hemispheres, may be rotated relative to one another around any of three mutually perpendicular axes.

Claim 6 of the '201 patent does not literally read on the Gustafson sphere because Nichols describes a solid cut by three perpendicular planes, while Gustafson is essentially a spherical shell cut by three perpendicular planes which rides on a spherical core. As a result, Claim 6 speaks of pieces with a plurality of faces (i.e. "the remaining faces") which do not have visually distinguishable indicia, while Gustafson's shell like octants have a colored "outer surface" and only one "inner surface."

CBS contends vigorously that the shell segments of the Gustafson puzzle have four internal faces because each edge is a face. In support of this position, Mr. Fischer, CBS' expert witness, argued that every solid, "even a piece of paper," has four faces, and, therefore, Nichols reads directly on Gustafson. While this may be technically correct, it flies in the face of the principle that words in patent claims are ordinarily to be given their usual meaning. I note, for example, that Gustafson, himself, distinguishes in his patent between the inner and outer *"surfaces"* of his pieces and their side *"edges"*.

Since Claim 6 contemplates a plurality of inner faces and Gustafson teaches a single inner face, Claim 6 is not anticipated by Gustafson.

VI. OBVIOUSNESS

CBS further contends that if Claim 6 is not found to be literally anticipated by Gustafson, it is at least obvious in light of the prior art, and that Claims 3, 4, 5, and 9 are obvious as well. In support of this position, CBS argues that "[a]s a matter of law, patentability does not arise from a mere change in form." It is urged that the sphere and the cube are obvious alternative forms and patentability cannot arise from a mere substitution of one for the other. It is clear, however, that the old "negative rules of invention" that preceded the enactment of Section 103 are no longer determinative in deciding individual cases. *See Chisum*, § 504[5] (1984). Form may be insubstantial, or it may be the essence of the invention, as where form determines function.

[17] The test of obviousness under 35 U.S.C. § 103 is whether "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." *Graham v. John Deere Co.*, 383 U.S. 1, 17, 86 S.Ct. 684, 693, 15 L.Ed.2d 545 (1968). As explained in the *Graham* case, the following factual inquiries are to be made: 1) the scope and content of the prior art are to be determined; 2) differences between the prior art and the claims at issue are to be ascertained; and 3) the level of ordinary skill in the pertinent art is to be resolved. It is in light of these facts that a determination as to the obviousness of the subject matter as a whole is to be made. Secondary considerations, such as commercial success, long felt but unsolved needs, the failure of others, etc. may also be taken into account.

A. The Prior Art

The parties agree that the Gustafson patent is the most pertinent prior art. As earlier noted, the Gustafson patent was not considered by the Patent Examiner. Of the five patents which were cited during the prosecution of the '201 patent, one was cited against the flat embodiment and was no longer relevant after that species was dropped and none of the other four covered a mechanical puzzle. Duggar, U.S. Patent No. 2,939,243, patented June 7, 1960, is not

a puzzle patent at all, but claims toy building blocks mounted with magnets to hold together the assembled structures. The Bowden, British Patent No. 283,666 (1928), and Pyle, British Patent No. 675,678 (1952), patents were cubic puzzles, but they consisted of individual blocks designed to be assembled one by one to display a pattern or picture on the external faces of the composite cube. Finally, the Dreyer patent, U.S. Patent No. 3,222,072, was also basically an assembly puzzle. It consisted of a series of 27 cubes strung along an elastic cord, the object being to assemble the cubes into a single composite cube.

The only other prior art puzzle which warrants mention is the MacMahon puzzle which was invented in 1893. This assembly puzzle consists of eight multi-colored subcubes which can be arranged to form a composite 2x2x2 cube. In its properly assembled form, each outer face of the composite cube must be of uniform coloration, and in addition, the color of the internal faces of the subcubes must be the same wherever two of the subcubes touch. The external coloration of this puzzle is similar to that of the Nichols and Rubik's cubes, with one solid but different color on each of the six sides of the composite cube.

B. Level Of Ordinary Skill In The Art

[18] The pertinent art is that of puzzle design. There does not appear to be any particular common denominator of formal academic training required; puzzle designers include artists, designers and other creative persons, as well as engineers and mathematicians. Still others active in designing puzzles are avid hobbyists, with little closely related formal training. A good example of this is Nichols himself, with a Ph.D. in organic chemistry.

Although there are professional puzzle designers working for the large toy companies, it appers that few concentrate all their efforts on puzzle design. Moreover, the significant breakthroughs in puzzle design are not infrequently made by puzzle enthusiasts and hobbyists rather than professionals as evidenced by Gustafson, Nichols and Rubik.

Moleculon's expert witness, Gerald Slocum, who is one of the foremost puzzle experts and puzzle historians in the world,

expressed his view that puzzles tend to arise as a single idea from a single individual. His study of nine hundred puzzle patents demonstrated that 86% were issued to persons who held no other puzzle patents, with another 10% of the inventors holding only two patents. He was also of the opinion that the level of skill in the art of puzzle design was very low compared to most scientific and engineering disciplines, because it tended to consist of isolated activity by individuals rather than a continuous building on an established base of knowledge. This explains the apparent discrepancy between the generally high level of education among those engaged in puzzle design, and the rather unsophisticated state of the puzzle art during the 1960's.

Based upon his study of the puzzle literature and patents, as well as his collection of puzzles, Slocum testified that the largest category of puzzles, patented and reported during that period were two- and three-dimensional jigsaw puzzles. The second largest category was two- and three-dimensional assembly puzzles. Finally, there were a few sliding-block puzzles, game puzzles, and some string or wire puzzles. Notably absent were complex mechanical puzzles.

Charles Zimmerman also testified as an expert witness for Moleculon. A civil engineer with a masters degree in structural engineering, Zimmerman worked in the Preliminary Design Department at Mattel Toymakers during the years 1963 through 1975. He was Supervisor of Preliminary Game Design at Mattel during 1968 and 1969, a position which included responsibility for developing a line of puzzles. He also was responsible for reviewing the hundreds of outside submissions received by Mattel. Zimmerman testified to the relatively unsophisticated level of the puzzle art during that period. He stated that he could "think of nobody in any toy company that was creating original puzzles, which were being marketed by toy companies." [Tr. 656]. The puzzles tended to be variations on old, familiar type puzzles, using attractive new materials. They did not involve elaborate mechanical mechanisms.

Based on the foregoing testimony, I conclude that the art of puzzle design was relatively unsophisticated and that artisans of ordinary skill in this field, while having higher than average education and intelligence, practiced the art as an avocation only.

C. The Differences Between The Prior Art And The Subject Matter Claimed

Comparing the prior art to the subject matter of the '201 patent requires that Claims 6, 3, 4, 5, and 9 of the '201 patent be considered individually since some are limited to the cube form of the puzzle while others seek to claim more broadly.

1. Claim 6

[19] As earlier indicated, the Gustafson puzzle is a sphere. Its surface is divided into octants which are capable of rotation in groups of four hemispherically related pieces around any one of three mutually perpendicular axes. The patent indicates that the external surface should bear some visual indicia, but no particular coloration is specified or claimed. Gustafson noted that:

> Assuming that certain color patterns are established in advance as the puzzle goals or solutions, it will further be understood that after the segments have been displaced from said established patterns that considerable imagination and color perception are required again to move the segments into the estabalished patterns.

Col. 5, l. 71 to Col. 6, l. 1.

In describing his invention, Nichols points out in the specifications that "other geometric configurations [than the cube] may be used. . . . For example, a sphere divided into eight octants represents the same concept in a different form." (Col. 2, l. 29-32). Claim 6 is deliberately drafted to be broad enough to cover such a sphere. The subject matter of Claim 6 may therefore be described as including a sphere divided along three mutually perpendicular plane and held in assembled form while permitting three groups of four contiguous pieces each to be rotated respectively around three mutually perpendicular axes, said pieces together having at least two visually distinct indicia.

The only difference between Gustafson's sphere and the Nichols' sphere is that the user of the Gustafson puzzle rotates sets of octant shaped shells which are held into a composite sphere by a tongue-in-groove arrangement involving a spherical core, while the user

of the Nichols sphere rotates sets of octant shaped pieces having a plurality of interior surfaces which are held together in a composite sphere by magnetic or mechanical means. While there is no outright concession by Moleculon in the briefing, I do not understand it to seriously contend that a puzzle designer of ordinary skill having been exposed to the Gustafson sphere would not have realized that Gustafson's shell pieces could be given a third dimension without interfering with their ability to rotate in sets around three mutually perpendicular axes. Indeed, Nichols himself, as well as Moleculon's experts, conceded that Gustafson's sphere and Nichols' Figure 4, depicting a sphere comprised of eight solid pieces, represented the identical puzzle concept. I, therefore, hold Claim 6 to be invalid under 35 U.S.C. § 103.

2. Claims 3, 4, 5, and 9

[20] In contrast to Claim 6, Claims 3, 4, 5, and 9 are limited to cubic embodiments. Claim 3, and its dependent claims, 4 and 5, will read on the 2x2x2 form of the puzzle, as well as on such larger cubic embodiments as the 3x3x3 and the 4x4x4, because it employs the open transitional phrase "which comprises." The term "comprising" denotes a patent claim as being "open," meaning that the recitation of structure in the claim is open to additional structural elements not explicitly mentioned. Rosenberg, *Patent Law Fundamentals* at 46 (1978).

Claim 9 on the other hand is limited to the 2x2x2 form of the puzzle composed of eight subcubes. Although Claim 9 also uses the open transitional term "comprising," this limitation is imposed because the claim explicitly refers to "visually distinguishable indicia on three faces only of each cube . . . " thereby excluding larger embodiments wherein the center cube(s) on a face will have only one colored surface. Claim 9, in contrast with Claims 3, 4, and 5, is also limited to a single preselected pattern consisting of a distinct indicia on each of the six faces of the composite cube.

As earlier noted, MacMahon teaches a cube shaped assembly puzzle. Even though there is a physical resemblance between Nichols' cube and the MacMahon puzzle in its assembled state, as puzzles they are fundamentally different in concept and challenge.

Nothing in MacMahon suggests the rotation of pieces to create a preselected pattern.

Gustafson, of course, does teach the rotation of octants of a sphere to achieve a preselected pattern and the issue for decision is whether it would have been obvious to one of ordinary skill in the puzzle design art in the late 1960's to combine MacMahon and Gustafson in such a way as to come up with Nichols' cube puzzles. I conclude that nothing in the prior art suggests such a combination and that Claims 3, 4, 5 and 9 are not obvious from MacMahon and Gustafson.

CBS, as I understand it, urges that, while there is no express teaching of a combination in his patent, Gustafson's concept itself would suggest a cube shaped embodiment to one of ordinary skill in the art. It relies heavily in this regard on the testimony of Mr. Zimmerman that he would have considered other possible shapes, including a cube, if the Gustafson puzzle had been submitted to him for commercialization by Mattel.

I agree with CBS that it would have been obvious to consider whether Gustafson's puzzle could be changed into other geometric shapes and to conclude that it would be possible to come up with a cube shaped embodiment. This does not mean, however, that the Nichols' concept for a cube shaped puzzle would obviously flow from Gustafson's concept or the patent describing it. Indeed, based on the record in this case, one can conclude with some confidence that the contrary is true. It would not have been obvious to realize that one could achieve a puzzle having many times the complexity, challenge and puzzle appeal of Gustafson by going to a cube and utilizing each of the 24 (as in the 2x2x2) or more (as in the 3x3x3 or 4x4x4) exposed faces of the subcubes as distinct pieces of the puzzle pattern the location of which vis-a-vis each other exposed face could be varied through rotations around three axes.

Slocum, like Zimmerman, acknowledged that, as a puzzle designer, he would have recognized the possibility of going to a cube from the Gustafson sphere. Both explained, however, that the advantages of the Nichols' cube as a puzzle would not have been

obvious. To Slocum, the Nichols' concept was "at the top of the list of breakthroughs;" to Zimmerman, it represented "a quantum leap from a sphere."

The most persuasive facts with respect to the nonobviousness of Nichols' puzzle, however, are those facts relating to the activities of Gustafson, himself. Gustafson is certainly one of at least ordinary skill in the art. Although not a breakthrough of the magnitude of the Nichols cube, his puzzle represents a significant advance over the prior art. After developing that puzzle, he realized that it would be a better puzzle if it offered a greater challenge than was presented by the manipulation of the eight faces covering his sphere. As a result, he considered other solids which would offer more complexity than the sphere. During this search for greater complexity, he dismissed the cube as offering only six faces and went on to work with such larger platonic solids as the octahedron, tetradecahedron, and icosahedron. None proved satisfactory, however. If the inventor of the Gustafson sphere did not perceive the superior puzzle which Nichols conceived, I am unwilling to say that one of ordinary skill in the art would have found Claims 3, 4, 5, and 9 obvious from Gustafson. Accordingly, I hold that Claims 3, 4, 5, and 9 are nonobvious and, therefore, valid.

VII. INFRINGEMENT OF CLAIM 9

Claim 9 is the narrowest apparatus claim. Moleculon maintains that it is infringed by CBS's two 2x2x2 puzzles – Rubik's Pocket Cube-Japan and Rubik's Pocket Cube-Taiwan. Claim 9 reads:

> A puzzle comprising eight cubes, visually distinguishable indicia on three faces only of each cube with the eight cubes together having six visually distinct indicia.
>
> means associated with each of the remaining faces only of each of the cubes releasably maintaining the cubes in assembled relationship forming a composite cube, said maintaining means enabling three interaffiliated groups of four contiguous cubes each to be rotated respectively about three

mutually perpendicular axes,

the six distinct indicia being so located on the respective cubes that the cube groups can be rotated to effect the display of a distinct indicia on each of the six faces of the composite cube.

According to CBS, Moleculon has not proved infringement of this claim by either of these accused puzzles because (1) their pieces are not "cubes" and have no "remaining faces," (2) their pieces are not "releasably maintained" in a composite cube, and (3) they have no "means associated with each of the remaining faces only" to hold the pieces together.

1. "Cubes" having Interior "Remaining Faces"

[21] CBS argues that the pieces of Rubik's Pocket Cubes are not "cubes" because a portion of each of the internal faces of each piece has been cut away to provide or accommodate the means for holding them in a composite cube. It is literally correct that the pieces of Rubik's Pocket Cubes are not geometrically pure cubes. It is also true, however, that from the perspective of the puzzle user they are accurately described as cubes and that Nichols was describing his invention from that perspective. The fact that Claim 9 was intended to refer to pieces that appeared to be cubes when incorporated in the puzzle rather than pure cubes is indicated by Nichols suggested embodiments utilizing "a pop-in snap linkage" or a "tongue-in-groove arrangement" since one would expect these approaches to involve either an indentation in or a projetion from the interior segment of the pieces. The reasonableness of Moleculon's interpretation of Claim 9's references to cubes is also demonstrated by the fact that Rubik referred to the equivalent pieces of his puzzle in his Hungarian patent as "cubes." (PX-66A; English translation). Similarly, Ideal's Rubik's Pocket Cube package refers to its pieces as "sub-cubes." (PX-67).

Just as Claim 9 does not require a perfect and complete cube, it also does not mandate perfect and complete internal faces which are square in shape. The accused devices have internal faces and the fact that they are partially cut away is not detectable from the

perspective of the puzzle user. Accordingly, I conclude that the puzzle described in Claim 9 of the '201 patent has "remaining faces."

2. "Means . . . Releasably Maintaining The Cubes In Assembled Relationship Forming a Composite Cube"

[22] CBS contents that the word "releasably" limits Claim 9 to structures the components of which can be disengaged from one another. Accordingly, it is urged, this claim covers Nichols' magnetically engaged cube, but not the various Rubik's cubes which are held together by complex mechanical mechanisms that do not lend themselves to ready disengagement during play.

CBS argues at length that in Nichols' early drafts of his patent application he used the term "releasably engaged" to connote a structure held together yet capable of being pulled apart or disengaged. This special meaning of the term "releasably" is alleged to have been carried over into the phrase "releasably maintaining" in the final patent claims, the result being that those claims cover only structures capable of ready disengagement during play. I find the drafts which preceded the patent application to be ambiguous on the point. These is evidence that Nichols at times used the words "releasably engaged" in the manner urged by the defendant, but I fail to find the consistency of usage suggested. Were it otherwise, I would still not give those drafts weight, however, since they are not available to those who would seek to determine the scope of the patent.

Most importantly, it is clear from the patent application itself both that Nichols recognized that some structures embodying his invention could be pulled apart or disengaged during play, while others could not, and that he intended to claim both types of structure. In the specifications of the '201 patent, it is stated unambiguously that "the invention includes such devices wherein the engagement is provided by mechanical or magnetic means providing structural integrity without restriction of rotational freedom . . . ." (Col. 1, l. 30-34). It is also explicitly pointed out in the section entitled "Description of Preferred Embodiment"

that while disengagement is an inherent feature of magnetically-engaged cubes "it is also posible to achieve engagement by mechanical rather than magnetic means, as for example by using a pop-in snap linkage, or a tongue-in-groove arrangement allowing rotation without disengagement." (Col. 2, l. 48-52).

There are only two independent apparatus claims in the '201 patent. Claims 6 and 9. Both use the phrase "releasably maintaining." Consequently, if the limitation urged by CBS is read into those words, there is a clear inconsistency with what the specification explicitly states to be the invention. While the meaning urged by CBS would not be unreasonable if one did not have the benefit of the specifications, in the context of the patent as a whole, it is far more reasonable to read the phrase "releasably maintaining" as referring to a means of holding the puzzle pieces in assembled relationship while permitting relative rotation of groups of pieces.[4]

[23] CBS maintains, however, that file wrapper estoppel precludes Moleculon from asking this Court to interpret "releasably" as just suggested. The doctrine of prosecution history of "file wrapper" estoppel serves to preclude a patent owner from regaining subject matter that was surrendered in order to obtain a patent: "[W]here . . . broad claims are denied and a narrowed one substituted, the patentee is estopped to read the granted claim as the equivalent of those which were rejected."

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[4] The phrase "releasably maintained" was drafted by the Patent Examiner as part of a suggested allowable claim. Nichols testified at trial that he accepted the term as written because "my general reaction . . . was that it was a good description of my invention, my puzzle device . . . . My general reaction was that it was a good description because maintaining . . . describes to my ear more effectively what the means are really to do, maintain this as a cubic assembly, than the word 'engage,' which alone doesn't say quite as much about it. But my reaction was to this basic linguistic level that it sounded to me like an intended improvement on the part of the Examiner, and I was willing to keep it as such . . . . My understanding of the phrase 'releasably maintain' was that it referred to a maintained structure, that is, one which is kept in the existing state, but which was releasable in the sense that it could be freed from that restraint in order to allow rotation." [Tr. 987-989].

Keystone Driller Co. v. Northwest Engineering Corp., 294 U.S. 42, 48, 55 S.Ct. 262, 265, 79 L.Ed. 747 (1935).

[24] In support of its position that Moleculon acquiesced in a narrowing construction of "releasably," CBS refers to a paragraph in the prosecution history in which Mr. Stevens, the patent attorney prosecuting the '201 patent on behalf of Nichols and Moleculon, made the following statement:

> At the interview the Examiner cited an additional reference, U.S. Patent 3,222,072, Dreyer. This reference has been considered and clearly does not disclose sets of cubes maintained in releasable relationship. This is supported in Figures 2 and 3 wherein all the cubes are physically secured together. In Dreyer the sets of cubes, such as in Figure 2, do not rotate about mutually perpendicular axes. . . . [DX-123, File Wrapper, at 35].

CBS argues that, by virtue of this statement, the '201 patent is limited to means of assembly that allow disengagement or disassembly of the composite structure.

Dreyer is an assembly block puzzle consisting of smaller blocks held together by an elastic band to provide a continuous unit. The puzzle is played by twisting the string of cubes in a variety of ways to create different shapes with the ultimate shape being a composite cube. Each cube in Dreyer is physically attached to the next cube by means of an elastic band, whereas in Nichols and in defendant's products, the cubes are not physically secured together in the Dreyer sense because they can be rotated during operation of the puzzle so that originally adjacent cubes are no longer adjacent to each other.

Stevens was trying to convey not that the Nichols puzzle may be separated when played, but rather the distinction that in Dreyer the cubes are permanently secured together in a particular order and there is no way to move, say, cube no. 3 out of its position. It will always have cube no. 2 on one side and cube no. 4 on the other no matter how they are twisted about. Stevens'

explanation to the patent examiner that "releasably engaged," as used in Nichols, demonstrated movement quite different from the movement of cube pieces available in Dreyer, did not in any way restrict or limit the meaning of the term "releasably." He simply explained that the kind of releasability employed in the Nichols puzzle does not exist in Dreyer, where the pieces are held together by an elastic cord and can never be rotated in sets so that adjacent cubes cease to be next to each other.

3. "Means Associated With Each Of The Remaining Faces Only Of Each Of The Cubes"

[25] Nichols' embodiment using magnets to "releasably" maintain the cubes in an assembled relationship forming a composite cube had magnets implanted in each of the faces which did not have a "visually distinguishable indicia" on it. Moreover, the mechanical means suggested by Nichols for releasably maintaining the cubes in a composite — i.e. "a pop-in snap linkage" or "a tongue-in-groove" arrangement — could presumably be executed in such a manner that there was either physical contact between the means and each internal face or incorporation of the means into each internal face. CBS relies upon these facts and the above-quoted language of Claim 9 in maintaining that such contact or incorporation is a material limitation on that claim. I find this reading of Claim 9 unduly restrictive, however.

"Associated" is not commonly regarded as limited to physical connection. It is frequently used, for example, to refer to component parts which unite with one another in function.[5] For this reason, I agree with Moleculon that "associated with" does not require contact with or incorporation in each internal face. I cannot agree, however, that it is broad enough to encompass any means which directly or indirectly "maintain[s] these [interior] faces in their physical relationship to the faces of the neighboring subcubes." (Pl. Br. p. 103).

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[5] *See, e.g. The Concise Oxford Dictionary* (1982) (joined in . . . function); Burton, *Legal Thesaurus* (1980) ("cooperant, cooperative, . . . coworking"); *Webster's Unabridged Third New International Dictionary* (1966) ("closely connected, joined, or united with another as in interest, function, activity, or office").

The means for "releasably maintaining" in Claim 9 does not hold the physical relationship of an internal face to any given face of a neighboring subcube. The only physical relationship which it does maintain is the "assembled relationship forming a composite cube" and the means perform precisely this same function for the external faces as well as the internal ones. Since we know that the draftsman, by virtue of his reference to the "remaining faces only," meant to convey the idea that the means was associated with the internal faces in a way it was not associated with the external faces, Moleculon's broad interpretation of "associated" cannot be accepted.

This does not end the matter, however. The internal faces of the subcubes of Rubik's Pocket Cube-Taiwan are partially cut away in such a manner that the structure constituting each face acts as a tongue which fits into grooves formed by other internal pieces so as to releasably maintain the integrity of the composite cube. Clearly, this relationship between the "means" and the "remaining faces only of each of the cubes" is an "association" within the meaning of Claim 9.

The mechanical "means" for maintaining the integrity of the composite cube of Rubik's Pocket Cube-Japan differs from that of the Taiwan pocket cube. While the "means" of "releasably maintaining" the Japanese version also relies upon the tongue-in-groove principle, the structures constituting the interior faces do not serve as the tongues.[6] They do cooperate with the "means," however, in maintaining the integrity of the composite cube by helping to maintain the alignment of the subcubes. Because of this cooperation in function, I conclude that the internal faces are "associated with" the means for "releasably maintaining" the Rubik's Pocket Cube-Japan.

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[6] The subcubes of the Rubik's Cube-Japan slide around on the surface of an internal sphere in the same manner as the shell pieces of the Gustafson puzzle. The "tongues" or "tabs" which fit into receptacles on the surface of the sphere are mounted on posts which are supported by the rear surfaces of the *external* faces and do not touch the *internal* faces.

[26] Even if the Japanese puzzle did not literally infringe Claim 9, however, I would nevertheless conclude that infringement has occurred under the doctrine of equivalents. "Under the doctrine of equivalents, an accused product that does not literally infringe a structural claim may yet be found an infringement "if it performs substantially the same function in substantially the same way to obtain the same result' as the claimed product." *Hughes Aircraft Company v. United States*, 717 F.2d 1351, 1361 (Fed.Cir.1983). Rubik's Pocket Cube-Japan is the same puzzle as the Nichols' 2x2x2; it functions in the identical manner to provide precisely the same challenge. The only difference, assuming no literal infringement, is that a tongue-in-groove, mechanical means not associated with "each of the remaining faces only" has been substituted for a tongue-in-groove, mechanical means which is so associated. Given the "quantum leap" above the prior art which the '201 patent represents, it is clearly entitled to a broad enough range of equivalents to encompass the Rubik's Cube-Japan.

VIII. CONTRIBUTORY INFRINGEMENT OF CLAIMS 3, 4 and 5

[27] The parties agree that method Claims 3, 4, and 5 can be infringed only by a puzzle user. For this reason, Moleculon has charged CBS with contributory infringement under 35 U.S.C. § 271(b), rather than with direct infringement. Section 271(b) reads simply:

> (b) Whoever actively induces infringement of a patent shall be liable as an infringer.

CBS is liable under this statute, according to Moleculon, because it has furnished others with a puzzle and accompanying instructions which facilitate and encourage their infringement of Claims 3, 4, and 5.

CBS first asserts that one using a Rubik's Cube in accordance with Ideal's directions would not infringe these claims. In support of this argument it suggests a number of distinctions between Claims 3, 4, and 5 and the operation of the Rubik's Cube.

However, each is inconsistent with the interpretations of the patent claims I have heretofore adopted and does not provide a basis for a holding of no contributory infringement.[7]

CBS' second argument is that there can be no finding of contributory infringement absent a finding of direct infringement and that there has been no evidence of anyone solving a Rubik's puzzle using the method of Claims 3, 4, and 5. While this contention merits more extensive discussion, I find it unpersuasive.

I assume, without deciding, that Moleculon has the burden of proving by a preponderance of the evidence that there has been direct infringement of the method claims within the United States.[8] I further assume, without deciding, that this means

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[7] Those suggested distinctions are:

(a) no Rubik's puzzle infringes because its pieces are not "cubes;"

(b) no Rubik's puzzle infringes because it cannot be restored to its pre-selected pattern (assuming three set/three axis randomization) by rotating only first and second sets or by rotating about only a first and second axis;

(c) no Rubik's puzzle fits the description "engaging eight cube pieces as a composite cube" because this cannot be done with just eight pieces in a 3x3x3 or 4x4x4 cube and because no external pieces of any Rubik's puzzle can be engaged without employing additional pieces;

(d) neither Rubik's Cube nor Rubik's Revenge fits the description "rotating a first set of cube pieces comprising four cubes about a first axis" because you have to rotate nine cubes in a 3x3x3, 16 in a 4x4x4.

Distinctions (a) and (b) are rejected because Claim 3, 4, and 5 do not require pure cubes and are not limited to puzzles which permit rotation about only two axes. Distinctions (c) and (d) are rejected because use of the word "comprising" makes these claims "open" ones.

[8] Since the record shows that the conduct which CBS has been inducing when performed, would constitute direct infringement of Claims 3 and 5, it can be

(Footnote continued)

Moleculon must show that someone in the United States actually *solved* a particular accused device by using one of the methods described in Claims 3, 4 or 5.[9] I do not assume, as does CBS, that Moleculon must make the required showing of direct infringement by direct, as opposed to circumstantial evidence. As with the vast majority of legally relevant facts a party can carry its burden of proof as to the fact of direct infringement with circumstantial evidence. *Bergstrom v. Sears, Roebuck & Co.*, 496 F.Supp. 476 (D.Minn.1980).

Ideal has sold tens of millions of dollars worth of Rubik's Cube puzzles, several millions of dollars of Rubik's Revenge puzzles and well over a million dollars of Rubik's Pocket Cube puzzles. In the first eleven months of 1981 alone, 8,400,000 Rubik's Cube puzzles were sold by Ideal in the United States. Each of these millions of puzzles can be operated in a manner which constitutes a direct infringement of Claim 3.[10] Thus, for example after randomization through rotation of sets of cubes around two or more axes, each can be restored to its preselected pattern by rotating sets of cubes around two or more axes.

Each of these millions of puzzles has been sold with an instruction sheet which teaches the preselected pattern, randomization, the objective of restoring the preselected pattern, and the pursuit of this objective through the rotation of sets of cubes

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argued with some force that the inducement and the threat of direct infringement engendered thereby is enough to warrant injunctive relief in Moleculon's favor. *Graham Paper Co. v. International Paper Co.*, 46 F.2d 881, 886 (8th Cir.1931) ("Defendant contends there could be no contributory infringement apart from a direct infringement. A completed act of infringement is not necessary to afford ground of [injunctive] relief. Threatened infringement is sufficient."); *see Leavitt v. McBee*, 124 F.2d 938, 941 (1st Cir.1942) ("It is well settled that a court will enjoin threatened infringement."); *Anraku v. General Electric Co.*, 80 F.2d 958, 965-66 (9th Cir.1936) (threatened sales of infringing lamps sufficient basis for injunctive relief).

[9] Moleculon argues that since the invention is a puzzle, there is direct infringement of Claim 3, for example, whenever a person rotates sets of cubes around two or more axes *in an attempt* to restore the preselected pattern.

[10] The same can be said for Claims 4 and 5, but it will suffice for present purposes to discuss only contributory infringement of Claim 3.

around two or more axes.[11] Each of these instruction sheets contains a notation, "IF YOU GIVE UP . . . we've got the solution and its available by mail." Those soliciting this assistance have been sent a booklet entitled "The Solution" which offers instruction on how to solve the puzzle. Any person following these instructions successfully would directly infringe Claim 3.

Purchase of one of the accused puzzles involves more than a negligible investment. Rubik's Cube puzzles, for example, were originally sold by Ideal to retailers at a price of $6.19. This fact as well as the mind set which prompts such a purchase and the nature of the puzzle itself provide assurance that most of these puzzles have experienced substantial use and that such use has been directed to accomplishing the objective of restoring the preselected pattern.

Based on the foregoing evidence, it is clearly more likely than not that each of the three types of accused puzzles has been used in the United States to infringe Claim 3 and that Ideal, by selling these puzzles and distributing its literature, has induced those direct infringements.[12]

While this circumstantial evidence provides ample support for these conclusions, I note that they are also supported by the eyewitness testimony of Dr. Obermayer. His testimony, which I

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[11] The instructions expressly depict only rotation of sets of cubes around two axes, but implicit in the presentation is the fact that the randomization and the solution may involve rotation around more than two axes. Similarly, the instructions for Rubik's Revenge and the Pocket Cubes do not expressly teach rotation of sets of cubes as the manner of solution, but that message is implicit.

[12] Moleculon has asked me to take judicial notice that people have used Ideal's puzzles in the United States and has supported that request with literature describing their use. There is no need to take judicial notice of this fact, however, since the record evidence establishes it as well as the additional fact that persons have *solved* each of these puzzles in the United States.

credit, was that he had witnessed a "Rubik's Cubathon" at a shopping mall in Burlington, Massachusetts, during which each of approximately sixty contestants was provided with a scrambled Rubik's Cube. As Obermayer watched, many of these contestants returned their Rubik's Cube to its preselected pattern. While this witness could not say that any contestant rotated sets of cubes around two or more axes, it is more likely than not, given the competitive nature of the Cubathon, that the cubes had been randomized in a way which required such rotation in order to restore the preselected pattern. Based on Obermayer's testimony, I conclude that the Rubik's Cube puzzle was used to directly infringe Claim 3 of the '201 patent in Burlington, Massachusetts, and that Ideal, by marketing the Rubik's Cube and sponsoring the Rubik's Cubathon, induced that infringement.

IX. CONCLUSION

For the foregoing reasons, I conclude (1) that Claims 3, 4, 5 and 9 of the '201 patent are valid, (2) that CBS has induced infringement of Claim 3 by selling and by instructing others in the use of Rubik's Cube, Rubik's Revenge, Rubik's Pocket Cube-Taiwan and Rubik's Pocket Cube-Japan, (3) that CBS has infringed Claim 9 by manufacturing and selling Rubik's Pocket Cube-Taiwan and Rubik's Pocket Cube-Japan, and (4) that CBS is not entitled to an award of counsel fees.

United States Court of Appeals for the Federal Circuit

MOLECULON RESEARCH CORPORATION,

Appellee,

v.

CBS, INC.

Appellant.

Appeal No. 85-2096

Before BALDWIN, NIES, and BISSELL, *Circuit Judges.*

ORDER

A petition for rehearing having been filed in this case, UPON CONSIDERATION THEREOF, it is

ORDERED that the petition for rehearing be, and the same hereby is, denied.

The suggestion for rehearing in banc is under consideration.

FOR THE COURT

Francis X. Gindhart, Clerk

Date

cc: Mr. Lewis H. Eslinger
Mr. Robert X. Perry, Jr.

United States Court of Appeals for the Federal Circuit

MOLECULON RESEARCH CORPORATION,

Appellee,

v.

CBS, INC.,

Appellant.

Appeal No. 85-2096.

Judgment

ON APPEAL from the UNITED STATES DISTRICT COURT FOR THE DISTRICT OF DELAWARE *in CASE NO(S).* 82-289-WKS

This CAUSE having been heard and considered, it is ORDERED and ADJUDGED:

AFFIRMED IN PART, VACATED IN PART, AND REMANDED

ENTERED BY ORDER OF THE COURT

Francis X. Gindhart, Clerk

DATED MAY 16 1986

ISSUED AS A MANDATE: July 8, 1986

§ 102. Conditions for patentability; novelty and loss of right to patent

A person shall be entitled to a patent unless—

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States

§ 103. Conditions for patentability; non-obvious subject matter

A patent may not be obtained though the invention is not identically disclosed or described as set forth in secton 102 of this title, if the differences betweeen the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negatived by the manner in which the invention was made. Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

§ 112. Specification

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

§301. Citation of prior art

Any person at any time may cite to the Office in writing prior art consisting of patents of printed publications which that person believes to have a bearing on the patentability of any claim of a particular patent. If the person explains in writing the pertinency and manner of applying such prior art to at least one claim of the patent, the citation of such prior art and the explanation thereof will become a part of the official file of the patent. At the written request of the person citing the prior art, his or her identity will be excluded from the patent file and kept confidential.

§1254. Courts of appeals; certiorari; appeal; certified questions

Cases in the courts of appeals may be reviewed by the Supreme Court by the following methods:

(1) By writ of certiorari granted upon the petition of any party to any civil or criminal case, before or after rendition of judgment or decree;

§1331. Federal question

The district courts shall have original jurisdiction of all civil actions arising under the Constitution, laws, or treaties of the United States.

§1338. Patents, plant variety protection, copyrights, trademarks, and unfair competition

(a) The district courts shall have original jurisdiction of any civil action arising under any Act of Congress relating to patents, plant variety protection, copyrights and trade-marks. Such jurisdiction shall be exclusive of the courts of the states in patent, plant variety protection and copyright cases.

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

Applicant: LARRY D. NICHOLS
Serial No.: 16,473
Filed: March 4, 1970
For: PATTERN FORMING PUZZLE AND METHOD WITH PIECES ROTATABLE IN GROUPS

Art Unit: 334 Examiner: Anton O. Oechsle
Patent No.: 3,655,201 Issued: April 11, 1972

DISCLAIMER

Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

Moleculon Research Corporation, a corporation of the Commonwealth of Massachusetts, having a place of business at 139 Main Street, Cambridge, Massachusetts 02142, represents that it was the original patentee of the above-identified patent by virtue of an assignment recorded in the United States Patent and Trademark Office on January 13, 1972 on Reel 2814 at Frame 825 and that is now the sole owner of said patent. It hereby disclaims claims 1 and 2.

MOLECULON RESEARCH CORPORATION
By Its President:

_____

Arthur S. Obermayer

Dated:
Cambridge, Massachusetts
April 19, 1983

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

In the Matter of
U.S. Letters Patent No. 3,655,201, Granted April 11, 1972
On Application No. 16,473, Filed March 4, 1970
Inventor: Larry D. Nichols
For: PATTERN FORMING PUZZLE AND METHOD WITH PIECES ROTATABLE IN GROUPS
Assignee: Moleculon Research Corporation
139 Main Street
Cambridge, Massachusetts 02142

CITATION OF PRIOR ART TO THE PATENT AND TRADEMARK OFFICE PURSUANT TO 35 U.S.C. §301

The undersigned, as attorney for the assignee above-identified, of the captioned patent hereby cites to the Office the items of patented prior art listed below which are believed to have a bearing on the patentability of claim 1 of said patent:

United States Patent 3,081,089 granted March 12, 1963 to William O. Gustafson on Application Serial No. 6,323 filed February 2, 1960;

Japanese Patent 38-10669 issued on or about June 28, 1963 to William O. Gustafson on an application claiming the priority of said U.S. Application Serial No. 6,323.

The work of William O. Gustafson in spherical puzzles having eight manipulatable surface pieces was patented by him in the early 1960's in the United States and Japan as shown in the cited prior art patents. This work, especially in the form shown in the Japanese patent cited, could arguably be said to be pertinent to the validity of claims of the captioned patent.

The Gustafson patents manifestly do not disclose the puzzles formed of cubelets rotatable in groups to form a composite, multi-piece cube or other composite, multi-piece rectangular solid that

are disclosed in the captioned patent, nor the magnetic means of releasably maintaining those cubelets in the composite also disclosed in that patent. Moreover, the Gustafson spherical puzzles comprise a minimum of nine mutually movable pieces, one of which, the spherical core, does not have a constantly exposed and a constantly nonexposed surface. It is not known and not believed that any actual Gustafson spherical puzzles were ever in public use or on sale in the United States or elsewhere.

MOLECULON RESEARCH CORPORATION

By _____

W. Brown Morton, Jr.
Reg. No. 15015
Route 1, Box 586
Warsaw, Virginia 22572
Its Attorney

May 24, 1982

BRIEF FOR APPELLEE

IN THE

United States Court of Appeals
for the
Federal Circuit

Appeal No. 85-2096

CBS INC.,

Appellant,

—v.—

MOLECULON RESEARCH CORPORATION,

Appellee.

ON APPEAL FROM THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE
(W.STAPLETON, CH.J.)

[4]

In early January, 1969, Dr. Obermayer happened to see the model in Nichols' office and expressed interest. (App. C. 93-94) Nichols explained its workings and allowed him to take it home.

EXCERPT FROM TRIAL TRANSCRIPT

[1000]

Obermayer - direct

* * *

Q. And you took it home within the new few days just to do that?

A. Yes.

Q. Who did you show it to at home?

A. I believe I showed it to my wife.

* * *

Parent Companies, Non-Wholly Owned Subsidiaries and Affiliates of CBS Inc.

CBS Catalogue Partnership
CBS Epic (Thailand) Limited
The CBS/Fox Company
CBS Gramophone Records and Tapes (India) Limited
CBS/MTM Co.
CBS Music (Thailand) Limited
CBS Nigeria Limited
CBS Records (Kenya) Limited
CBS/Sony Group, Inc.
Igaku-Shoin/Saunders Ltd.
Mainstream Communications Corp.
Shorewood Packaging Corp. of Canada, Limited
Trintex
Winterland Concessions Co.

All of the above-named companies are non-wholly owned subsidiaries of CBS Inc.

EDITOR'S NOTE

THE FOLLOWING PAGES WERE POOR HARD COPY AT THE TIME OF FILMING. IF AND WHEN A BETTER COPY CAN BE OBTAINED, A NEW FICHE WILL BE ISSUED.

86-534

Supreme Court, U.S.
FILED
SEP 29 1986
JOSEPH F. SPANIOL, JR.
CLERK

No.

IN THE

Supreme Court of the United States

OCTOBER TERM, 1986

CBS INC.,

Petitioner,

vs.

MOLECULON RESEARCH CORPORATION,

Respondent.

PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

(OVERSIZED PATENT APPENDIX)

LEWIS H. ESLINGER
WILLIAM E. PELTON
600 Third Avenue
New York, New York 10016
Attorneys for Petitioner

September 29, 1986

Of Counsel:
ABIGAIL F. COUSINS
ESLINGER & PELTON, P.C.
600 Third Avenue
New York, New York 10016

United States Patent [15] 3,655,201
Nichols [45] Apr. 11, 1972

[54] PATTERN FORMING PUZZLE AND METHOD WITH PIECES ROTATABLE IN GROUPS

[72] Inventor: Larry D. Nichols, Arlington, Mass.
[73] Assignee: Moleculon Research Corporation, Cambridge, Mass.

[22] Filed: Mar. 4, 1970
[21] Appl. No.: 16,473

[52] U.S. Cl. ..... 273/153 R, 46/25
[51] Int. Cl. A63f 9/08
[58] Field of Search ..... 273/155, 156, 157 R, 153 R; 35/22 R; 46/24, 25

[56] References Cited

UNITED STATES PATENTS

3,222,072	12/1965	Dreyer	273/153 R UX
636,109	10/1899	Bowers	273/155
2,939,243	6/1960	Duggar	46/24

FOREIGN PATENTS OR APPLICATIONS

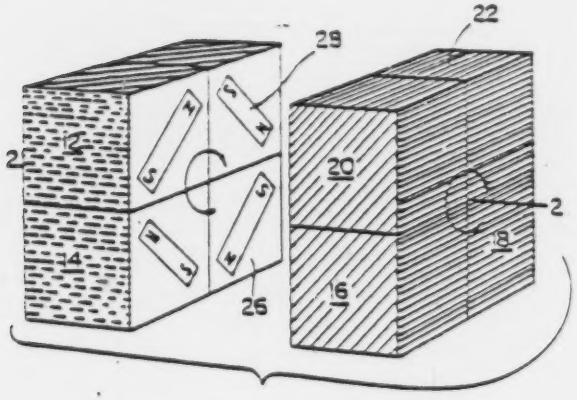
283,666	1/1928	Great Britain	273/156
675,678	7/1952	Great Britain	273/157

Primary Examiner—Anton O. Oechsle
Attorney—Richard P. Crowley and Richard L. Stevens

[57] ABSTRACT

Eight cube-type pieces are magnetically engaged to form a cube-type assembly with educational and entertaining features. The cubes are adapted to rotate in complementary sets of four about one of three mutually perpendicular axes. Each cube has colored surfaces and when properly arranged one distinct color on each of the six faces is presented. Each set which shares one face of the assembly may be rotated in multiples of 90° with respect to the other set. If the assembly is initially arranged properly and then disarranged by a random sequence of rotations, it then serves as a device whose object is the restoration of the original arrangement.

10 Claims, 6 Drawing Figures



Patented April 11, 1972 3,655,201

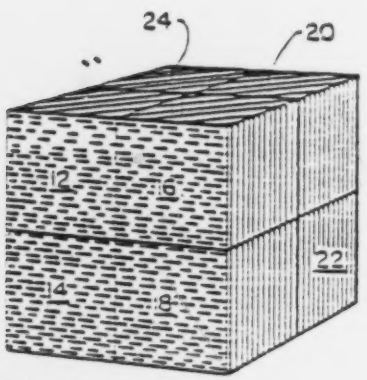


FIG. 1

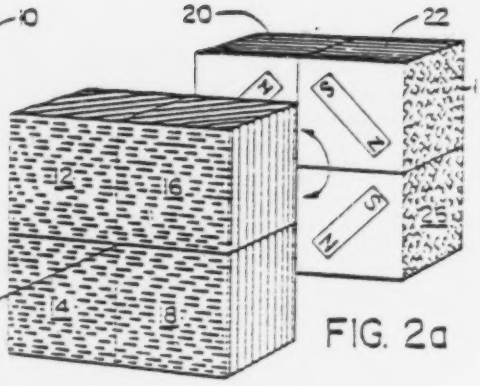


FIG. 2a

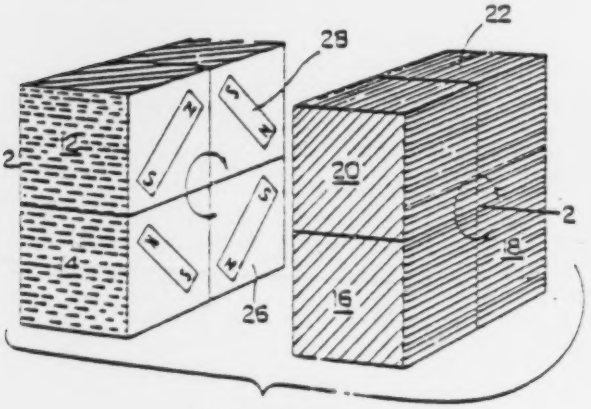


FIG. 2b

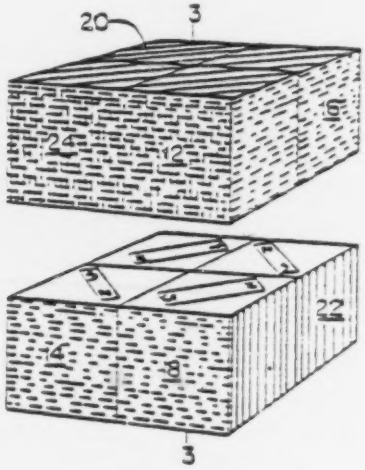


FIG. 2c

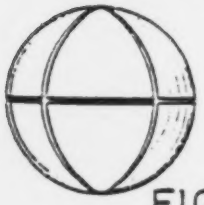
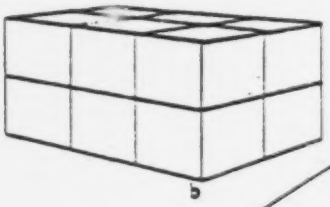


FIG. 4



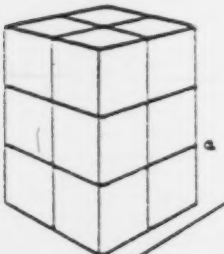


FIG. 3

INVENTOR
LARRY D. NICHOLS
BY Cushman, Darby & Cushman

ATTORNEYS

PATTERN FORMING PUZZLE AND METHOD WITH PIECES ROTATABLE IN GROUPS

SUMMARY OF THE INVENTION

This invention relates to a device which may be utilized as a new form of puzzle in which portions of an assembly of engaged mobile pieces are rotated relative to one another about various axes in an effort to achieve certain predetermined arrangements of the pieces. Aside from its entertaining aspects, the device also finds application in the educational field to demonstrate the effect of repetitive operations on symmetrical structures, and particularly to demonstrate noncommutative operations in which the final result depends on the order of the individual steps; such noncommutative operations are fundamental to modern mathematics and science. The device may also be used to provide practice in the comprehension and visualization of complex spatial structures and to promote training in the application of algorithms to problem solving; it poses certain problems best solved by previous mastery of important algorithmic sequences of operations. It can also be expected that this device, like many other puzzles combining manual and mental skills, will prove useful in psychological and psychiatric testing programs.

Briefly, the invention comprises a set of internally engaged and externally decorated pieces assembled into a structure which constantly poses a choice between two or more distinct manual operations, each consisting of rotation of one set of pieces with respect to the remainder, and each leading to a different subsequent arrangement of pieces and another choice of alternative operations. In particular, the invention includes such devices wherein the engagement is provided by mechanical or magnetic means providing structural integrity without restriction of rotational freedom, and wherein each piece is colored or patterned on its exposed surfaces in a way which allows its arrangement, with the other pieces, into a recognizable predetermined pattern whose establishment is the object of manipulation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an isometric view of one embodiment of the invention in a three-dimensional form;

FIGS. 2a, 2b, and 2c are isometric views of FIG. 1 defining the various axes about which the various subsets of the structure may rotate;

FIGS. 3a and 3b are alternative embodiments of FIG. 1; and

FIG. 4 is an isometric view of an alternative embodiment of the invention in three-dimensional form.

DESCRIPTION OF PREFERRED EMBODIMENT

The preferred embodiment will be described in reference to a three-dimensional structure as shown in FIG. 1 which comprises a cube 10 divided into eight smaller cubes 12–26. Each cube includes an exposed surface and a nonexposed surface. The nonexposed surfaces as shown in FIG. 2 are characterized by having magnet means 28 disposed therein which are adapted releasably to engage with the nonexposed surfaces of similar cubes. As shown each of the cubes has an exposed surface which comprises three faces of the cube, each face having a different color thereon. In FIG. 1 each of the eight cubes is arranged so that the entire face of any of the six sides of the complete structure presents a uniform color. In other words, the exposed surfaces are colored so as to allow the complete cube if its component parts are properly arranged to present one distinct coloration on each of its six faces. With this embodiment of the invention, rotation of any set of four smaller cubes which share one face of the larger cube with respect to the other set of four cubes is an allowed movement or twist. That is, each such set can be rotated about a mutual axis with respect to the other set without relative movement of the individual cubes within either set. If the structure is initially arranged properly and then disarranged by a random sequence of twists about the three possible axes as shown in FIGS. 2a, 2b, and 2c, it then serves as a device whose object is the restoration of the original arrangement.

In FIG. 2a, the cubes 12, 14, 16, and 18, and the cubes 20, 22, 24, and 26 comprise respectively a first and second set which may be disengaged from one another and rotated about the axis shown by line 1—1. As shown in FIG. 2a, the second set has been twisted 90° counterclockwise from its position in FIG. 1. In FIG. 2b the cubes 16, 18, 20 and 22 form a third set and the cubes 12, 14, 24 and 26 form a fourth set, these sets being adapted to rotate about a second axis shown by line 2—2. As shown in FIG. 2b, the fourth set has been twisted 90° counterclockwise from its position in FIG. 1. Similarly referring to FIG. 2c, the cubes 12, 16, 20 and 24 form a fifth set and the cubes 14, 18, 22 and 26 form a sixth set each set again, as the others, magnetically engaged and adapted to rotate about the third axis shown by line 3—3. As shown the fifth set has been twisted 90° counterclockwise from its position in FIG. 1.

The allowed twists include rotation of any of the six sets as defined in FIGS. 2a, 2b, and 2c through 90°, 180°, or 270° with respect to its complementary set.

In FIG. 1 the device is in the solved or pattern-established position, the six faces of the cube each being a uniform and distinguishable color or pattern. As shown, the faces are colored as follows: back face black, bottom face orange, top face brown, front face silver, right face red, and left face gold. Any number of random twists of the sets one with respect to another about the different axes scrambles the pattern. The solution then requires restoring the cube to its original configuration.

Although the three-dimensional aspect of the invention has been described with reference to a cube, other geometric configurations may be used for a three-dimensional embodiment. For example, a sphere divided into eight octants represents the same concept in a different form; the octants fall into six sets in a manner similar to the cube, such as shown in FIG. 4, in that the eight octants are divided by three coordinate planes along which the various sets may be disengaged and twisted.

If desired, fewer than six colors may be used making the restoration of the predetermined pattern simpler to achieve, or other color schemes or graphic representations may be placed on the exposed surfaces of the device.

Although FIGS. 1 and 2 have been described with particular reference to eight cubes magnetically engaged and adapted to form various sets of four cubes each able to twist about a fixed axis, this effect may be multiplied in other embodiments. For example, referring to FIG. 3 additional sets of cubes are added to the basic embodiment to provide additional planes within which various sets of pieces may rotate or twist with respect to other sets. In any of these three-dimensional embodiments it is also possible to achieve engagement by mechanical rather than magnetic means, as for example by using a pop-in snap linkage, or a tongue-in-groove arrangement allowing rotation without disengagement.

What I claim is:

1. A method for restoring a preselected pattern from sets of pieces, which pieces have constantly exposed and constantly nonexposed surfaces, the exposed surfaces adapted to be combined to form the preselected pattern, which sets when in random engagement fail to display said preselected pattern which comprises:

a. engaging a plurality of pieces in a coherent structure;

b. providing a first set having at least two pieces each of said pieces having an exposed and a nonexposed surface;

c. providing a second set having at least two pieces each of said pieces having an exposed and a nonexposed surface;

d. providing a third set having at least four pieces each of said pieces having an exposed and a nonexposed surface, the third set forming with the first and second sets a composite structure, the exposed surfaces of each of the sets forming a portion of the composite preselected pattern;

e. rotating said pieces in complementary sets of four about any of three mutually perpendicular axes; and

f. repeating step (e) until the preselected pattern is achieved.

2. The method of claim 1 which includes rotating said sets about their respective axes through multiples of 90°.

3. A method for restoring a preselected pattern from sets of pieces which pieces have constantly exposed and constantly nonexposed surfaces, the exposed surfaces adapted to be combined to form the preselected pattern, which sets when in random engagement fail to display said preselected pattern which comprises:

a. engaging eight cube pieces as a composite cube;

b. rotating a first set of cube pieces comprising four cubes about a first axis;

c. rotating a second set of four cubes about a second axis; and

d. repeating steps (b) and (c) until the preselected pattern is achieved.

4. The method of claim 3 which includes rotating sets of cubes about one of three mutually perpendicular axes with reference to the composite structure.

5. The method of claim 3 wherein the sets of cubes are rotated through multiples of 90°.

6. A puzzle comprising at least eight pieces, visually distinguishable indicia on at least one face of each piece with the eight pieces together having at least two visually distinct indicia, means associated with each of the remaining faces only of each of the pieces releasably maintaining the pieces in assembled relationship forming a composite structure, said maintaining means enabling three interaffiliated groups of four contiguous pieces each to be rotated respectively about three mutually perpendicular axes, the two distinct indicia being so located on the respective pieces that the groups can be rotated to effect the display of at least two distinct indicia of the composite structure.

7. The puzzle of claim 6 wherein the composite structure is a sphere and the visually distinguishable indicia is on the exposed face only on each piece.

8. The puzzle of claim 6 wherein the means to releasably maintain the pieces in assembled relationship includes magnets.

9. A puzzle comprising eight cubes, visually distinguishable indicia on three faces only of each cubes with the eight cubes together having six visually distinct indicia,

means associated with each of the remaining faces only of each of the cubes releasably maintaining the cubes in assembled relationship forming a composite cube, said maintaining means enabling three interaffiliated groups of four contiguous cubes each to be rotated respectively about three mutually perpendicular axes,

the six distinct indicia being so located on the respective cubes that the cube groups can be rotated to effect the display of a distinct indicia on each of the six faces of the composite cube.

10. The puzzle of claim 13 wherein the means releasably maintaining the cubes in assembled relationship includes magnets.

* * * * *

March 12, 1963 W. O. GUSTAFSON 3,081,089

MANIPULATABLE TOY

Filed Feb. 2, 1960 2 Sheets-Sheet 1

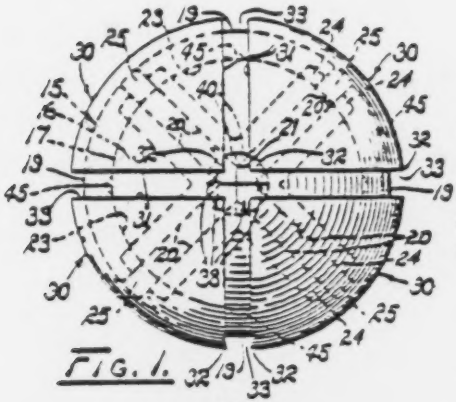


FIG. 1.

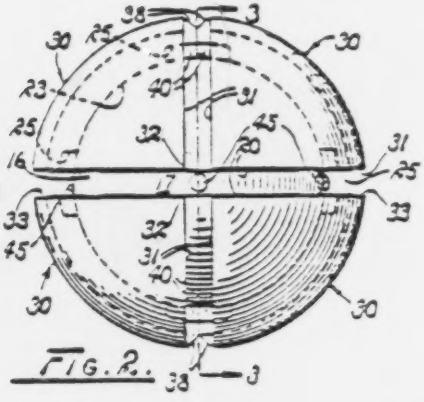


FIG. 2.

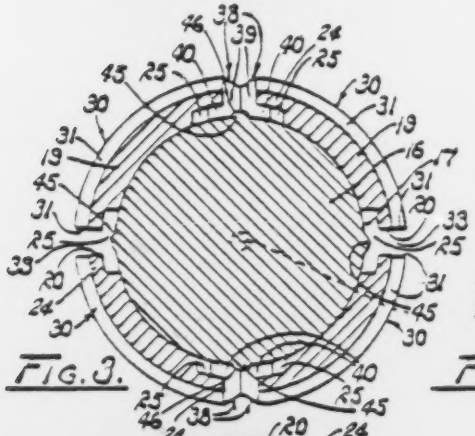


FIG. 3.

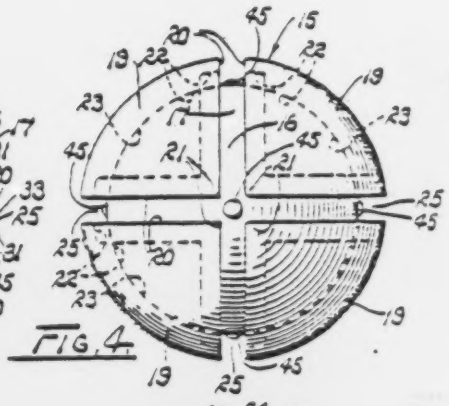


FIG. 4.

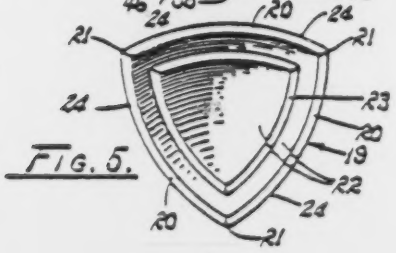


FIG. 5.

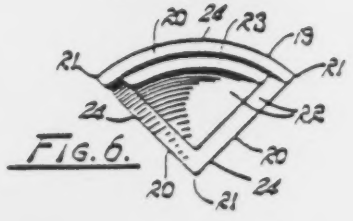


FIG. 6.

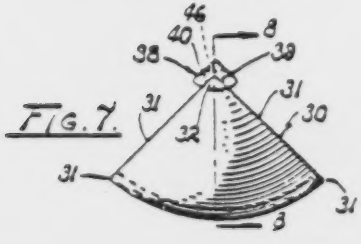


FIG. 7.

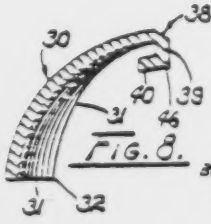


FIG. 8.

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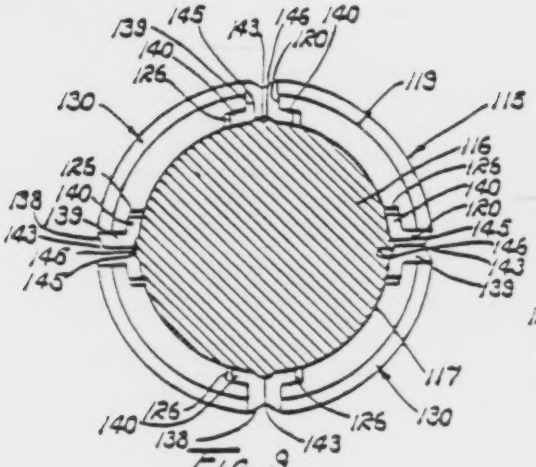

FIG. 9.

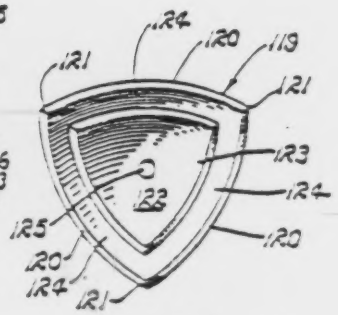

FIG. 10.

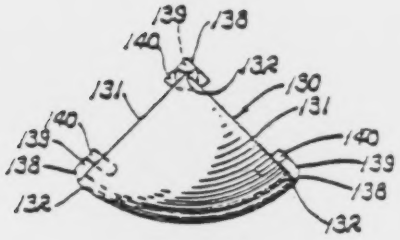

FIG. 11.

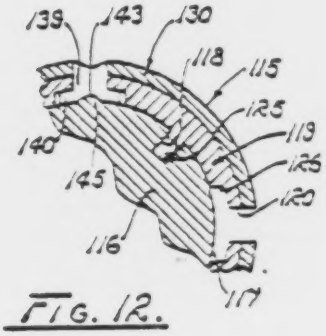

FIG. 12.

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3,081,089

MANIPULATABLE TOY

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Filed Feb. 2, 1960, Ser. No. 6,323
6 Claims. (Cl. 273—156)

The present invention relates to a manipulatable toy and more particularly to a mechanical puzzle having a plurality of vari-colored parts which are movable relative to each other to form various patterns.

The present application is a continuation-in-part of my prior copending United States patent application, Serial No. 793,872, filed February 17, 1959, and now abandoned in favor of this application. It is known in puzzles to employ a plurality of parts adapted for connection or disconnection, or for relative movement, in a predetermined and possibly baffling manner, sequence, or ordered arrangement. Such puzzles challenge the user's ingenuity, manual dexterity, patience and intelligence to effect a solution. It is to this type of puzzle that the manipulatable toy of the present invention relates.

Accordingly, it is an object of the present invention to provide a manipulatable toy having a plurality of vari-colored parts movable relative to each other to form various patterns.

Another object is to provide a manipulatable toy having a plurality of movable elements in random or shuffled arrangement and which present problems of relative movement to preconceived ordered arrangement.

Another object is to provide a puzzle adapted to test color perception.

Another object is to provide a puzzle adapted to challenge the intelligence and understanding of the user.

Another object is to provide a puzzle utilizing movable parts which require manual dexterity to arrange or rearrange into predetermined positions relative to each other.

A further object is to provide a device of the character described which is in the form of a sphere having movable segments.

Another object is to provide such a toy which is easy to construct and assemble and which can be disassembled, if desired.

Other objects are to provide a puzzle or toy which is economical to manufacture, challenging to use, and which is adapted for use by persons of all ages.

These, together with other objects, will become more fully apparent upon reference to the following description.

In the drawings:

FIG. 1 is an end elevation of a puzzle embodying the principles of the present invention and showing hidden inner portions thereof in dashed lines.

FIG. 2 is a side elevation of the puzzle of FIG. 1 rotated through substantially ninety degrees from the position shown in FIG. 1.

FIG. 3 is a transverse section taken on line 3—3 of FIG. 2.

FIG. 4 is an end elevation of an internal ball-shaped member forming part of the puzzle of the subject invention.

FIG. 5 is a somewhat enlarged inside face view of an inner spherically triangular segment as utilized in the subject puzzle.

FIG. 6 is an edge view of the segment of FIG. 5.

FIG. 7 is an outside face view of an outer segment and tongue both of which form a part of the puzzle of the present invention.

FIG. 8 is a cross-section taken on line 8—8 of FIG. 7.

FIG. 9 is a view similar to FIG. 3 and showing a modified form of the subject invention.

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FIG. 10 is a view similar to FIG. 5 showing an inner segment constituting a part of the second form of the present invention.

FIG. 11 is a view similar to FIG. 7 showing an outer segment embodying the principles of the second form of the invention.

FIG. 12 is a fragmentary radial section of the puzzle of the modified form of the subject invention.

Referring more particularly to the accompanying drawings, the puzzle of the present invention includes an inner ball-shaped member, generally indicated by the numeral 15, and including a core 16 having an outer substantially spherical surface 17, as indicated in dashed lines in FIGS. 1, 2 and 4, and in full lines in FIG. 3. The ball-shaped member also includes a plurality of substantially octantal equilaterally spherically triangular, and therefore concavo-convex, inner segments 19 of substantially uniform size and thickness. The inner segments have substantially the same spherical curvature as the core and, thus, are adapted to fit complementarily against the outer surface of the core.

Each inner segment 19 includes three side edges 20 meeting in a corresponding number of apices 21 and defining equal angles thereberween. Each inner segment also provides an inner surface 22, an inner spherically triangular mounting portion 23 edgewardly inwardly spaced from the side edges of the segment and are marginally undercut to provide marginal flanges 24. The inner surfaces of the flanges are radially offset from the inner surface of the mounting portion.

The inner surfaces 22 of the mounting portions 23 of the inner segments 19 are complementarily fitted against the outer surface 17 of the core 16 so that the inner segments are collectively in substantially spherical formation concentrically circumscribing the core. The mounting portions space the inner surfaces of the flanges 24 radially outwardly from the outer surface of the core, as best indicated in FIG. 3. Further, the adjacent side edges 20 of adjacent segments are in spaced parallel relation to each other and define three annular intersecting T-shaped grooves 25 in concentric circumscribing relation to three right-angularly related axes extended through the center of the core. That is, the grooves are individually in three perpendicularly related planes, or great circle lines of division, passing diametrically through the core 16. The grooves extend laterally under said flanges 24 as well as radially outwardly between the adjacent side edges in said described T-shaped cross-section. Thus, each groove has a maximum width between edgewardly opposed mounting portions and a minimum width between opposed side edges. Preferably, a suitable cement intimately bonds the contacting inner surfaces 22 of the segment and the outer surface 17 of the core so that the segments are rigidly connected to the core.

The puzzle also includes a plurality of substantially octantal equilaterally spherical, isosceles, triangular, outer segments 30 of the same curvature as the inner segments 19. Likewise, the outer segments provide side edges 31 meeting in apices 32. The outer segments are slidably fitted in overlaying relation against the inner segments 19 in substantially spherical formation about, and substantially enveloping the inner segments, and are concentric to the core 16. Adjacent edges of adjacent outer segments are in substanually parallel spaced relation and define three annular intersecting great circle lines of divinon in the form of slots 33 concentrically circumscribing the core. These slots are in individual planes extended diametrically through the ball-shaped member 15. These planes are in mutually perpendicular relation to each other. Preferably, the slots are of the same width as the minimum width of the grooves 25. Thus, portions of the

inner segments are visible through the slots and, when the slots are in registration with the grooves, portions of the outer surface 17 of the core 16 are visible through the slots and the grooves.

With the outer segments 30 fitted over the inner segments 19, as above described, there are provided first and second sets of hemispherically related outer segments having generally oppositely diametrically related first and second sets of adjacent apices 32 at opposite poles of the core 16. These adjacent apices are in substantially rectangular relation to each other. Polar tongues 38 are individually rigidly connected to the apices of said first and second sets of apices. The tongues include legs 39 radially inwardly extended into the grooves 25 between opposed side edges 20 and quadrant-shaped slide members 40 connected to the legs and extended transversely in the grooves under the flanges 24. The slide members are between edgewardly opposed mounting portions in slidable contact with the outer surface 17 of the core 16 and the inner surfaces 22 of the flanges 24, all as best seen in FIGS. 1 and 3. As best indicated in FIG. 1, however, the slide members of each adjacent set of apices are in interfitted relation and collectively are in substantially circular formation having a diameter greater than the minimum width of the grooves but less than the maximum width of the grooves. It will be evident that the outer segments 30 are slidably connected to the inner segments 19 but that a tongue 38 extends only from one apex 32 of an outer segment.

Detents 45 are extended outwardly from the core 16 in the grooves 25 and substantially centered between the adjacent apices 21 of the inner segments at opposite poles of the three axes defined by the grooves. The slide members 40 collectively provide sockets 46 individually adapted to receive the detents upon movement of the outer segments 30 into positions with the slide members overlaying the detents.

Preferably, the core 16, and the inner and outer segments 19 and 30, as well as the tongues 38, are made of either hard or soft plastic, but other materials may be employed, as will be apparent. Still further, the outer surface 17 of the core, and the outer surfaces of the segments are of a variety of colors. The outer surface of the core may be of a single color or have bands or sectors of various colors. Likewise, each segment may be of a single color or have bands or sectors of various colors.

Operation

The operation of the described embodiment of the subject invention is believed to be readily apparent and is briefly summarized at this point.

The described first and second sets of hemispherically related outer segments 30 may be individually rotated about a common axis extended diametrically of the core 16 substantially through the centers of the interfitted slide members 40. The outer segments are connected to the inner segments 19 and maintained in collective spherical formation about the inner segments because of the interlocking association between the slide members 40 and the flanges 24 of the inner segments, that is, because the slide members are confined between said flanges and the core, as illustrated in FIGS. 1 and 3. This applies, of course, whether the slide members are located at the intersections of the grooves 25, or at other positions along any one of the grooves, because the flanges always overlay the slide members. However, each of the outer segments can be separated from the ball-shaped member 15 by flexing the flanges outwardly, as may be visualized in FIG. 3, to allow the tongue 38 on said outer member to be slipped outwardly of the groove and from under the flange. This, of course, assumes that the outer segments and particularly the flanges thereof are made of flexible material. It is also well to note at this point that the inner and outer segments are assembled and connected to the core in one of two ways. First, and prior to cementing the inner segment to the core, the slide member of the outer segment is fitted under the flange of the inner segment at one of the apices 21 of the inner segment and so that the segments are substantially congruent. Thus, with this method of assembly, both of the segments are applied to the core at the same time. Alternatively, the inner segments are cemented to the core in the described positions and, thereafter, the outer segments are applied by flexing the flanges outwardly and inserting the slide members under the flanges in a manner now believed evident.

Additionally, the outer hemispherically segments 30 may be collectively rotated about any one of the three axes of the grooves 25. Of course, it is necessary to move the first and second sets of outer segments in small increments relative to each other in effecting collective rotation. When the sockets 46 fit over the detents 45, a slight clicking sound occurs, in addition to a vibration imparted to the user's fingers. This informs the user of the relative positions of the inner and outer segments 19 and 30 and of his progress in rotating the outer segments. At any intersection of the grooves 25, the first and second sets of outer segments may be individually rotated about core axes extended through said points of intersection, as described above.

Second Form

With particular reference to FIGS. 9, 10, 11, and 12 a ball-shaped member 115 includes a spherical, solid core 116 having an outer surface 117. This core has a plurality of elongated bores 118 extended radially inwardly from the outer surface of the core at predetermined positions about the periphery of the core. There are four pairs of bores in the illustrated embodiment, only one of which is shown in FIG. 12. Each pair of bores is in coaxial alignment and each of said axes extends through the center of the core. Said axes are in perpendicular relation to each other so that the axes of adjacent bores intersect in ninety degree angular relation to each other.

A plurality of substantially equilateral, spherically triangular, inner segments 119 are provided, as before. These inner segments have a plurality of side edges 120 meeting in apices 121. The inner segments also have inner concave surfaces 122, inner mounting portions 123 inwardly spaced from the side edges, marginal flanges 124, and elongated pins 125 integrally connected to the inner mounting portions centrally of the segments and extended radially inwardly from the mounting portions.

The inner surfaces 122 of the mounting portions 123 are complimentarily fitted against the outer surface 117 of the core 116 with the pins 125 individually fitted in the bores 118. Prior to fitting of the inner segments against the core, the inner surfaces and the pins are preferably coated with a liquid bonding cement. Obviously, the outer surface of the core and the bores may also be given a thin coating of liquid cement so that when the segments are fitted in the described manner against the core, the segments are adherently bonded to the core. Because of the location of the bores and the fitting of the pins therein, the segments are automatically collectively fitted in substantially spherical formation in concentrically circumscribing relation to the core. This fitting could be assured to an even greater degree by making the pins and bores non-circular. The relationship between the inner segments and the core is the same as that previously described and is not considered in any greater detail at this point except to note that three annular intersecting T-shaped grooves 126 are again defined by the core and the inner segments.

The second form of puzzle also includes a plurality of substantially equilateral, spherically triangular, outer segments 130 having the same shape as the outer segments 30 of the first form of the present invention. These outer segments have side edges 131 meeting in apices 132. In the illustrated embodiments, there are eight inner and outer segments 119 and 130 with the inner segments individually overlying the bores 118.

However, tongues 138 are provided at each of the apices 132 of each of the outer segments 130. As before, these tongues include legs 139 outwardly extended from the apices and slide quadrants 140 transversely extended from the legs relatively inwardly of the outer segments. The outer segments are slidably fitted in overlying relation against the inner garments 119 and complimentary thereto so as to provide a plurality of sets of adjacent apices 132. The adjacent quadrants at the intersections of the grooves 126 are interfitted in circular formation in the same manner as that illustrated in FIG. 1 and described in connection with the first form of the present invention. Of course, since tongues are provided at each apex, there are adjacent interfitted apices at each of the intersections of the grooves. The side edges 131 of adjacent outer segments 130 are in spaced parallel relation and provide annular, intersecting slots 143.

The core 116 also has a plurality of detents 145 extended outwardly from the outer surface 117 and centered between adjacent apices 121 at the intersections of the grooves 126. The slide quadrants have sockets 146 adapted to receive the detents individually therein when the sockets are located at the intersections of the grooves, as previously described in connection with the first form of the invention.

It is to be understood that the outer segments 130 are assembled in the puzzle in the following manner. Prior to connection of the inner segments 119 to the core 116, the outer segments are placed in overlaying congruent relation with the inner segments and with the slide members 140 underlaying the flanges 124 at the apices 121 of the inner segments. Thus, when the inner segment is attached to the core, the outer segment is automatically positioned in proper location.

While the foregoing procedure is preferred, alternatively, the flanges 124 and outer segments 130 and tongues 138 are sufficiently flexible to enable the outer segments and tongues to be fitted over the inner segments after the latter have been attached to the core 116.

The puzzle is operated in substantially the same manner as that described in connection with the first form of the invention. That is, the outer segments 130 can be collectively, incrementally rotated about any one of the three axes concentrically circumscribed by the grooves 126. This is accomplished by moving the four sets of collectively interfitted slide quadrants 140 located in any one of the grooves 126 about the core 116 in said groove while the opposite sets of collected slide quadrants diametrically oppositely related to each other simply turn about their respective detents 145 on the axis of the groove traversed.

When the three slots 143 are individually in registration with the three grooves 126, that is, when the outer segments 130 are individually in congruent overlaying relation to the inner segments 119, either set of four outer segments constituting a hemisphere can be independently rotated about the core. Thus, it is evident that by employing various colors for the core, the inner segments, and the outer segments, that an intriguing and interesting puzzle is provided. The second form of the invention is assembled and held together in a different manner from the first form of the invention and may be preferred if it is desired to associate the outer segments with the inner segments in a more dependable relationship.

It will be evident from the foregoing that by the described movement of the outer segments 30, or 130, relative to the inner segments 19, or 119, and remembering that the core 16, or 116, and the segments are variously colored, that a variety of color combinations and patterns can be obtained. Assuming that certain color patterns are established in advance as the puzzle goals or solutions, it will further be understood that after the segments have been displaced from said established patterns that considerable imagination and color perception are required again to move the segments into the established patterns. Thus, in this manner, a puzzle is provided for challenging the visual acumen, manual dexterity, and patience of the user and providing training in recognizing and associating various colors.

Although the invention has been herein shown and described in what is conceived to be the most practical and preferred embodiments, it is recognized that departures may be made therefrom within the scope of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices and apparatus.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A toy puzzle comprising a core having a substantially spherical smooth outer surface substantially concentric to the center of the core; a plurality of substantially triangular fractionally spherical inner and outer segments of substantially uniform size having side edges, the inner segments having mounting portions providing inner surfaces secured to the core with said inner segments in substantially spherical formation and providing marginal flanges having inner surfaces in radially spaced relation to said outer surface of the core and substantially concentric to the center of the core with adjacent edges of the flanges of adjacent segments being in spaced parallel relation so as to define a plurality of annular intersecting grooves in concentric circumscribing relation to axes extended through the center of the core, the outer segments rotatably slidably overlying the inner segments in substantially spherical formation concentric to the core with adjacent edges of adjacent outer segments being in substantially parallel spaced relation to define a plurality of slots disposed in substantially perpendicularly related planes passing through the center of the core, there being first and second sets of semi-spherically related outer segments having tongue members individually rigidly connected thereto and extended radially inwardly toward the core through said grooves and slidably interlockingly engaging the flanges of the inner surfaces of the inner segments for enabling relative rotatable movement of the first and second sets of outer segments on the inner segments and for enabling collective rotatable movement of the outer segments relative to the inner segments about the axes of the grooves.

2. The puzzle of claim 1 wherein each tongue member includes a leg rigidly connected to the outer segments, and a slide member connected to the leg of its respective tongue, the slide members associated with each set of semi-spherically related outer segments having a collective dimension greater than the minimum width of the grooves but less than the maximum width of the grooves.

3. The puzzle of claim 1 wherein the inner surfaces of the inner segments are cemented to the outer surface of the core.

4. The puzzle of claim 1 wherein the core has a plurality of bores radially inwardly extended from the outer surface of the core and individually located substantially centrally of the outer segments, and wherein pins are individually integrally centrally connected to the inner surfaces of the inner segments, said pins being individually radially inwardly extended into the bores and being adherently connected to the core.

5. A toy puzzle comprising a core having a substantially spherical, smooth outer surface substantially concentric to the center of the core; a plurality of substantially triangular fractionally spherical inner and outer segments of substantially uniform size having side edges meeting in apices, the inner segments having mounting portions integral with the core with said inner segments in substantially spherical formation and providing marginal flanges having inner surfaces in radially spaced relation to said outer surface of the core and substantially concentric to the center of the core with adjacent edges of the flanges of

adjacent segments and being in spaced parallel relation so as to define a plurality of annular intersecting grooves in concentric circumscribing relation to axes extended through the center of the core, the outer segments rotatably slidably overlaying the inner segments in substantially spherical formation concentric to the core with adjacent edges of adjacent outer segments being in substantially parallel spaced relation to define a plurality of slots disposed in substantially perpendicularly related planes passing through the center of the core, there being first and second sets of semi-spherically related outer segments having a plurality of pairs of diametrically oppositely related sets of adjacent apices at opposite poles of the core; and a tongue member rigidly connected to each apex of each outer segment and extended radially inwardly toward the core into said grooves for enabling relative rotatable movement of the first and second sets of outer segments on the inner segments and for enabling collective rotatable movement of the outer segments relative to the inner segments about the axes of the grooves.

6. A toy puzzle comprising a core having a substantially spherical smooth outer surface substantially concentric to the center of the core; a plurality of substantially triangular fractionally spherical inner and outer segments of substantially uniform size having side edges meeting in apices, the inner segments having inner surfaces, mounting portions complementarily secured to the outer surface of the core, and flanges marginally outwardly extended from the mounting portions and terminating in the side edges of the inner segments, the inner segments being thereby connected to the core in concentric substantially spherical formation thereabout with the flanges in

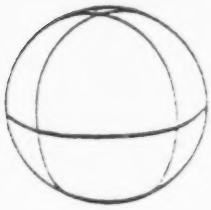
radially spaced relation to the core and adjacent edges of adjacent segments being in spaced parallel relation and defining a plurality of annular intersecting T-shaped grooves in concentric circumscribing relation to axes extended through the center of the core, the outer segments rotatably slidably overlaying the inner segments in substantially spherical formation concentric to the core with adjacent edges of adjacent outer segments being in substantially parallel spaced relation to define a plurality of slots disposed in substantially perpendicularly related planes passing through the center of the core, there being first and second sets of semi-spherically related outer segments having oppositely diametrically related first and second sets of adjacent apices at opposite poles of the core; and tongues individually connected to the apices of the first and second sets of apices and extended radially inwardly toward the core into said grooves between said adjacent side edges and thence transversely under the flanges between said flanges and the core, the tongues being slidable between the flanges and the core for movement in the grooves to enable relative rotatable movement of the first and second sets of outer segments on the inner segments and to enable collective rotatable movement of the outer segments relative to the inner segments about the axes of the grooves.

References Cited in the file of this patent

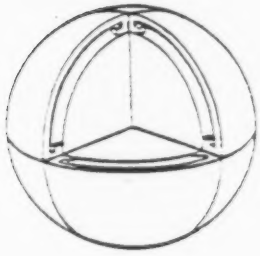
UNITED STATES PATENTS

333,971	Royall	Jan. 5, 1886
479,475	Stutz	July 26, 1892
1,629,582	McClintock	May 24, 1927
2,001,067	Lane	May 14, 1935

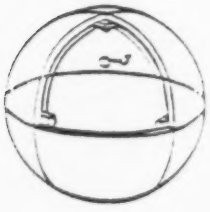
第1図　A



第1図　B



第2図　A



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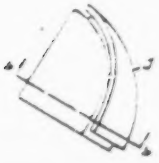
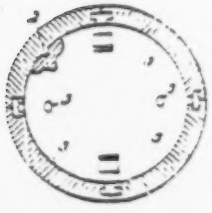
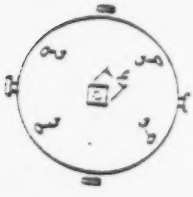


第3図　A



第3図　B

第4図　A



第4図　B

第5図　A

第5図　B

第6図　A

特　許　庁　　特許出願公告

120 D 0

特　許　公　報　　昭38－10669

公告 昭38.5.28　出願 昭36.1.13　特願 昭36－800

優先権主張 1960.2.2（アメリカ国）

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パ　ズ　ル　玩　具

図面の簡単な説明

図面はこの発明によるパズル玩具の二つの実施例を示し、図番に夫々A，Bを添えて示す。

第1図Aは完成品を示す。第2図Aは内部工作を示すための基礎要素の一つを立体に描いた未完成品を示す。第3図Aは内部工作を示すための基礎要素の四つを立体に描いた未完成品を示す。それは実際のパズルを手付かずない位置に回動される。第4図Aはパズルが作られる半球入的球面外形の外方正面を表現するピンを有する内方球を示す。球は中空であり得る。第5図Aはパズルの八つの基礎要素の一つを示す。第6図は第5図の断面を示す。

第1図Bは内部工作を示すため内部の八分球の一つ（第2図B）と基礎要素（第5図B）とが立体に描かれたパズルの図である。第2図Bは基礎要素を埋入的球面外形に支持するために設けられた内方心を形成する八分球の一つの図である。第3図Bは第2図Bと同じ部品を示す他の図である。第4図Bは第5図Bの断面である。第5図Bはパズルの基礎要素四ら一つの球面状三角の図である。これらは八つある。

発明の詳細な説明

この発明はパズル玩具等に種々の色または一クの入つの三角形の球面状三角に切られかつ半球状で互に可動の球面外表に関する。

パズルにおいて多数の部品が通常用いられてある順序または型列を作ることは知られている。そのようなパズルは解答を得るための使用者の忍耐と知識に挑戦する。この発明に関するものはこの型のパズルである。

従つてこの発明の目的は種々な型列を形成するための多数に対し可動の多数のものまたは部品を有するパズル玩具を提供することである。他の目的は可動部品を有する球の形の様で型成される課題を提供することである。別の目的は構造に選択的であり、使用に挑戦し、どの年の人も楽しめられるパズル玩具を提供することである。

これらの詳細は図面についてのこれからの説明の後に明らかとなる。

この発明は二つの実物用型を有る。二つの型は一つの発明を構成していることがいえる。図示された大きは二つの型で同じでないことはパズルがどのような部合のよい大きでもよいから理解がない。

作　用

この発明のA型もB型も同じように操作される。

この操作は容易に明らかであると考えられ、ここに簡単に示される。

半球状に構造されられた四つの三角のどの組も一手で心に押され、その手で他の半球が90度またはその倍数回動された。この種大回動は止め具2（第5図Bに示されている）及び対応凹み3によつて確定的に容易にされ、それらの凹みは外方正面が適当な型列に決められるようにされる。パズルは可使材料（何か適当な可塑性物）である。上の具と凹みとは同様な操作を可能にするようにされる。

この相対的運動は三つの互に直交な軸のどれかについて行われる。これによつて非常に多数の異なつた型列が得られる。

寸法C（第4図A）は寸法4（第5図A）の2倍より大きくなければならない。

寸法4（第5図B）は寸法b（第4図B）の2倍より大きくなければならない。

これは三角が回動される半球面形のままであることを確実にすることになる。

組　立

A型一つのピンは最終の四つの三角が一緒に置かれた孔に置かれなければならない。ピンは孔内で回転される。

B型第5図Bの部分は第2図B部分上に置かれ、第4図Bの外面が第5図Bの内面に接する。これらの八つはある種のジグ内に一緒に置かれ、それから第4図Bのすべての半球は前記ジグ内に保持されている間に固着される。

特許請求の範囲

1　本質的に等しい三角角正分に別られ、埋入的に内方で固着され、半球状に構造された部で三つの相互直交軸のどれかの周の90度またはその倍数回動できる八分球面外表。

Agreed Upon Translation of Gustafson

Patent Application
Publication
1963/10669

Patent Office

Patent Bulletin

Publication	:	June 28, 1963
Application	:	January 13, 1961; 1961/800
Priority claim	:	February 2, 1960 (U.S.A.)
Applicant	:	Inventor William Oliver Gustafson E, 2712 Robinson Avenue Ward 3 Fresno, California USA
Representative	:	Patent Agent Goshio Kanamaru and two others

PUZZLE TOY

Brief Explanation of the Drawing

The drawing shows two embodiments of puzzle toys according to this invention. To each drawing number the letter A or B has been appended.

Figure 1A shows a completed article. Figure 2A shows an incomplete article from which there has intentionally been removed one of the basic elements in order to show the construction of the inner part. Figure 3A shows an incomplete article from which there has been intentionally removed four of the basic elements in order to show the construction of the inner part. These have been rotated into an unstable position. Figure 4A shows the inner sphere having pins which permanently maintain the outer facade of the spherical surface after the puzzle has been manufactured. The sphere may be hollow. Figure 5A shows one of the eight basic elements of the puzzle. Figure 6 (sic; should be 6A) shows a cross section of Figure 5 (sic; should be 5A).

Figure 1B is an illustration of a puzzle from which there has intentionally been removed one (Figure 2B) of the eights-of-a-sphere of the inner part and a basic element (Figure 5B) in order to show the construction of the

inner part. Figure 2B is an illustration of one of the eights-of-a-sphere which form an inner core. The inner core is provided in order to maintain the basic elements permanently in the form of an outer spherical surface. Figure 3B is another illustration showing the same component part as Figure 2B. Figure 4B is a cross section of Figure 5B (sic; should be 2B). Figure 5B is an illustration of a basic element: namely, one of the triangles in the form of a spherical surface. There are eight of these.

Detailed Explanation of the Invention

This invention relates to puzzle toys, especially spherical shells which are cut into eight triangles in the form of a triangle-shaped spherical surface having various colors or marks and the exterior surface skin of the sphere is movable in a group making up half of the sphere.

Among puzzles there is known the construction of sequences or arrangements which generally make use of many parts. Such puzzles challenge the patience and knowledge of its users in order to find a solution. This invention relates to this type of puzzle. (Lit.: Things which relate to this invention are this type of puzzle.)

Therefore, an object of this invention is to offer a puzzle toy having many things or parts which are movable with respect to certain groups of them in order to form

various arrangements. Another object is to offer the said apparatus after it has acquired a spherical form having movable parts. A particular object is to offer a puzzle toy which is economical in manufacture, a challenge in use and fascinating for all ages.

These details will become clear upon reading the following explanation in connection with the drawings.

This invention takes on two game forms. One can say that the two forms comprise one invention. The fact that the sizes shown in the drawing are not the same in the two forms is of no significance because the puzzle may be of any convenient size.

Operation

This invention is operated the same whether form A or form B is used.

This operation may easily be thought of as clear and is shown herein simply.

Any group of four triangles which are associated in a hemisphere can be pressed against the core in a "move" of the puzzle, and by that "move" one can rotate the other hemisphere 90° or any multiple thereof. This multiple rotation is easily done positively by means of stops 2 (shown in Figure 5B) and opposing hollow 3; these hollows cause the outer facade to be fixed in a suitable array. The

puzzle is made of flexible material such as a suitable plastic. The stops and hollows make smooth operation possible.

This opposing movement occurs about any of three mutually perpendicular axes. In this way one can have very many different arrangements.

The dimension C (sic) (Figure 4A) must be more than twice as large as the dimension d (Figure 6A).

The dimension a (Figure 5B) must be more than twice as large as the dimension b (Figure 4B).

This means that when triangles are rotated their spherical-surface pattern is maintained.

Construction

One pin of the A form must be placed in the socket after the last of the four triangles have been put together. The pin is affixed inside the socket.

The part shown in Figure 5B of the B form is placed on top of the part shown in Figure 2B. The outer surface of Figure 4B touches the inner surface of Figure 5B. These eight pieces are placed together inside some type of jig, and then all the flat surfaces of Figure 4B are affixed together while they are maintained inside the aforesaid jig.

Patent Claim

(1) Eight-of-a-sphere spherical shells which are divided into essentially equal right-angle, regular triangular parts, which are permanently held to the inside and which can be rotated by 90 degrees or a multiple thereof about any of three mutually perpendicular axes in clusters associated into hemispheres.

No. 86-534

Supreme Court
FILED
NOV 26 1986
JOSEPH F. SPANIOL, JR.
CLERK

IN THE

Supreme Court of the United States

OCTOBER TERM, 1986

CBS INC.,

Petitioner,

v.

MOLECULON RESEARCH CORPORATION,

Respondent.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

---

RESPONDENT'S BRIEF IN OPPOSITION

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November 26, 1986

PRESS OF BYRON S. ADAMS, WASHINGTON, D.C. (202) 347-8203

QUESTIONS PRESENTED

1. Whether this Court should grant review of a court of appeals ruling on an interlocutory judgment where that ruling remands the case to the district court for further proceedings on liability and there has been no determination on damages.

2. Whether review should be granted where: (a) both the trial court and the court of appeals concluded there had been no "public use" under Section 102(b); (b) there is no evidence of any kind of a giving over of the invention to the public; and (c) the private use by the inventor of his invention prior to the critical date included only limited exposure to intimate friends and close colleagues, with no commercially motivated activity or relinquishment of control over the invention.

3. Whether review should be granted where: (a) both the trial court and the court of appeals held the Nichols cube puzzle invention was a nonobvious advance over the prior art; (b) the Nichols invention was found to be a "breakthrough" and a "quantum leap" over the prior art; (c) in making these findings the district court complied fully with the requirements set forth in *Graham v. John Deere Co.*, 383 U.S. 1 (1966); and (d) the Court of Appeals for the Federal Circuit found no reason to disturb these findings.

4. Whether review should be granted where: (a) the court of appeals' challenged treatment of a document entitled "Citation of Prior Art" involved no factual findings; (b) the document in question was the subject of a stipulation between the parties during the pretrial proceedings; (c) the district court considered the file history of which the document was a part but

made no explicit finding in its lengthy opinion; and (d) petitioner had made no argument regarding the document in its brief to the district court.

PARTIES

The following statement is made pursuant to Rule 28.1. Moleculon Research Corporation has been succeeded in interest by Moleculon Research Company. Moleculon Research Company is a substantial shareholder of Moleculon, Inc., a publicly traded corporation.

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CASES: Page

ACS Hosp. Systems, Inc. v. Montefiore Hosp., 732 F.2d 1572 (Fed. Cir. 1984) 14

Brotherhood of Locomotive Firemen and Engineers v. Bangor & Aroostook R. Co., 389 U.S. 327 (1967) 8

Egbert v. Lippmann, 104 U.S. 333 (1881) 6,10,11,12

Environmental Designs, Ltd. v. Union Oil Co. of California, 713 F.2d 693 (Fed. Cir. 1983) *cert. denied*, 464 U.S. 1043 (1984) 14,15

Graham v. John Deere Co., 383 U.S. 1 (1966) i,6,12,15,17,18

Graver Tank & Mfg. Co. v. Linde Air Products Co., 336 U.S. 271 (1949), *adhered to*, 339 U.S. 605, *reh. denied*, 340 U.S. 845 (1950) 7

Jones v. Hardy, 727 F.2d 1524 (Fed. Cir. 1984) .. 14

Medtronic, Inc. v. Daig Corp., 789 F.2d 903 (Fed. 1986), *cert. denied*, 55 U.S.L.W. 3315 (1986) 18

Preemption Devices, Inc. v. Minnesota Mining & Mfg. Company, 732 F.2d 903 (Fed. Cir. 1984), *later proceeding*, 630 F. Supp. 463 (E.D. Pa. 1985), *later proceeding*, 229 U.S.P.Q. 270 (E.D. Pa.), *later proceeding*, 231 U.S.P.Q. 297 (Fed. Cir. 1986) 16,17

Raytheon Co. v. Roper Corp., 724 F.2d 951 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 835 (1984) 14,15

Smith v. Snow, 294 U.S. 1 (1935), *reh. denied*, 301 U.S. 670 (1937) 15

TP Laboratories, Inc. v. Professional Positioners, Inc., 724 F.2d 965 (Fed. Cir.), *motion denied*, 466 U.S. 967, *cert. denied*, 469 U.S. 826 (1984) 8,9

United States v. Adams, 383 U.S. 39 (1966) 14,15,16,17

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IN THE

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OCTOBER TERM, 1986

No. 86-534

CBS INC.,

Petitioner,

v.

MOLECULON RESEARCH CORPORATION,

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On Petition for a Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

---

RESPONDENT'S BRIEF IN OPPOSITION

I. COUNTERSTATEMENT OF THE CASE

A. The Litigation

This is an action for infringement of U.S. Patent No. 3,655,201 ("Nichols patent") (Pet. App. B, p. B-1) brought on May 25, 1982 by Moleculon Research Corporation ("Moleculon"), as patentee as a result of pre-application assignment of the invention from the inventor, Larry D. Nichols ("Nichols"). The action was begun against Ideal Toy Corporation ("Ideal") and the present defendant, CBS Inc. ("CBS" or

"petitioner"), was substituted after it acquired Ideal later in 1982.

The accused Ideal-CBS products were four rotating cube puzzles: the well-known "Rubik's Cube" ("the 3x3x3"), two versions of "Rubik's Pocket Cube" ("the 2x2x2", which although identical in appearance have somewhat different interior mechanisms) and the "Rubik's Revenge" ("the 4x4x4"). The Complaint charged infringement of Claims 1-5, 6, and 9 by these puzzles. Claims 1 and 2 were disclaimed by Moleculon before trial.

A two-week trial was held in early 1984 in the United States District Court for the District of Delaware before then Chief Judge Walter K. Stapleton, sitting without a jury. The trial dealt solely with issues of validity and infringement, questions of damages and other related issues having been bifurcated.

By Order dated October 2, 1984 (Pet. App. A, p. A-22) the district court adjudged that method Claims 3-5 were valid and infringed by solving or attempting to solve each accused cube and that apparatus Claim 9 was valid, but infringed only by the two 2x2x2 cubes. The district court also adjudged Claim 6 invalid under 35 U.S.C. § 103 in light of two prior art patents to one Gustafson. This Order was supported by an exhaustive Opinion of the same date (Pet. App. A., pp. A-23 to A-58).

CBS, invoking the special interlocutory appeals provision for patent cases in 28 U.S.C. § 1292(c)(2), appealed to the Court of Appeals for the Federal Circuit. No appeal was taken from the holding of invalidity of Claim 6. The court of appeals affirmed the holding of validity of Claims 3-5 and 9 and the

holding of the infringement of all of them by the 2x2x2 cubes. In regard to Claims 3-5, however, the Federal Circuit held that there was no literal infringement of them by the 3x3x3 and 4x4x4 cubes and remanded to the district court for its consideration of the issue of whether solving those cubes infringed Claims 3-5 under the doctrine of equivalents. The court of appeals denied CBS' petitions for reconsideration and suggestion for rehearing in banc without opinion.

Federal jurisdiction in the court of first instance is based upon 28 U.S.C. § 1338(a).

B. Pre-Litigation Facts Relevant To The Issues Presented

Larry D. Nichols, Moleculon's Chief Scientist and the inventor of the puzzle which is the subject of the patent in suit, (Pet. App. B, pp. B-1 to 4) conceived the idea of a rotating cube puzzle while a college student in 1957. Between 1959 and 1962, he constructed two or three puzzle models from heavy paper and magnets, but they were not durable and each lasted only a short time. During this period, while Nichols was a graduate student at Harvard, a few close friends including two roommates and a Chemistry Department colleague had occasion to see one of the paper models in Nichols' room. (Pet. App. A, pp. A-1 to 2, A-23 to 24).

Upon completion of his graduate studies in 1962, Nichols accepted employment as a research scientist with Dr. Arthur Obermayer, the president of Moleculon. In late 1968, Nichols found some small, strong magnets and for the first time made a durable, wood-block prototype puzzle. For a few months Nichols kept

the puzzle at home, but on rare occasions took it to his office. Apart from his family, Nichols showed the model only to a few intimate friends and close colleagues. At all times he retained control of it. (Pet. App. A, pp. A-2, A-24 to 25).

In early January, 1969, Dr. Obermayer happened to see the wood model in Nichols' office and expressed interest. Nichols explained the puzzle and allowed him to take it home. Subsequently, when Obermayer asked whether he intended to commercialize the puzzle, Nichols answered in the negative, and Obermayer suggested that Moleculon might help find a licensee. Nichols responded in a generally affirmative manner and roughly two months later, on March 6, 1969, he executed an agreement assigning his rights in the puzzle invention to Moleculon in return for a share of any proceeds of commercialization. Thereafter, Moleculon undertook an effort to evaluate the commercial potential of the puzzle. (Pet. App. A, p. A-25).

Toward the end of 1969, Nichols began working on Moleculon's patent application. After the exchange of several drafts between Nichols and the company's attorney, an application was filed March 4, 1970, on Moleculon's behalf. The patent on the Nichols invention issued April 11, 1972. (Pet. App. A, p. A-25).

In 1974 a Hungarian instructor in interior design, Erno Rubik, conceived an idea for a cube puzzle and secured a patent for it in that country in December, 1977. Subsequently, Ideal entered into agreements with Rubik and a Hungarian government agency to produce and market the puzzle.

In the summer of 1980, shortly after Ideal commenced selling the Rubik's Cube, Ideal's in-house pat-

ent counsel Richard Rabkin conducted a search at the U.S. Patent Office and discovered the Nichols patent. (Rabkin Dep., p. 59). Although he saw the similarities between the Nichols' and Rubik's cube puzzles, Rabkin told no one and Ideal continued to market the puzzle without inquiry or notice to Moleculon. (Rabkin Dep., pp. 146, 156-57, 163, 172).

In February or March of 1981, Obermayer, the president of Moleculon, discovered Ideal's Rubik's Cube and thereafter wrote to Ideal advising of the Nichols patent. Ideal responded through patent counsel Rabkin that it had studied the prior art and believed that Rubik's Cube did not infringe any valid patent claims. (Pet. App. A, pp. A-25 to 26). In August, 1981, Obermayer met with Ideal's Chairman to discuss the possibility of a license under the Nichols patent. Shortly before the meeting Ideal learned of the Gustafson patent, which it then gave to Obermayer. When subsequent discussions between counsel failed to produce an agreement, this suit was instituted. (Pet. App. A, pp. A-25 to 26).

II. SUMMARY OF ARGUMENT

A. The issues upon which petitioner seeks review have each been determined adversely to it by both the district court and the court of appeals. Where rulings are based on concurrent findings of fact by two lower courts, usually they will not be reviewed by this Court absent a very obvious and exceptional showing of error. No such showing has been made here. Further, and very significantly, the decision of the court of appeals is not a final judgment. The Federal Circuit has remanded the case to the trial court for further proceedings bearing on the issue of

liability. The decisions of both the trial court and the court of appeals are grounded on the application of well-established principles of patent law to the particular facts of this case. While this Court in its discretion may issue a writ of certiorari to a court of appeals in such circumstances, there is no reason, compelling or otherwise, to do so.

B. The issue of "public use" under 35 U.S.C. § 102(b) was decided by both the lower courts on the particular facts of the instant case after careful review of all the surrounding circumstances. The facts in *Egbert v. Lippmann*, 104 U.S. 333 (1881), where there had been a clear dedication of the invention to the public and the invention was in widespread public use prior to the critical date, differ from the facts here in many controlling respects.

C. The district court, applying the standards of *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966), found the Nichols invention and in particular Claims 3-5 of the patent in suit nonobvious—a "breakthrough" and "quantum leap" over the prior art. The court of appeals found no reason to disturb these findings. In seeking here to demonstrate error, petitioner has mischaracterized the Nichols patent claims and conjured a split of authority within the Federal Circuit where none exists.

D. The "Citation of Prior Art" which was the subject of a stipulation between the parties during the pretrial proceedings, was considered by the district court but not regarded as sufficiently important to be discussed. Petitioner made no argument regarding the citation in its brief to the district court. The Federal Circuit's determination to give the citation no weight was properly based upon the uncontroverted

statements in the citation and the fact that the citation had been filed years after the grant of the patent. There is no basis for CBS' contention that the Federal Circuit made impermissible findings regarding this document.

III. ARGUMENT

A. Lack Of Justification Under Rule 17

Petitioner has failed to identify any "special" or "important" reason for review on a writ of certiorari under this Court's Rule 17. The issues of public use and obviousness, which together comprise the principal thrust of the petition, were decided initially by the district court after placing heavy reliance on the credibility of three critical witnesses—the inventor Nichols and respondent's two experts, one of whom the court termed "one of the foremost puzzle experts and puzzle historians in the world." (Pet. App. A, p. A-42). Moreover, this Court has a policy of refraining from reviewing the concurrent findings of fact by two lower courts absent a very obvious and exceptional showing of error. *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 336 U.S. 271, 275 (1949), *adhered to*, 339 U.S. 605, *reh. denied*, 340 U.S. 845 (1950).

In light of the bifurcated trial and the remand by the court of appeals, this case lacks finality. Should Moleculon secure a favorable determination of the remand issue and an award of damages, with both determinations affirmed on appeal, there is a possibility that petitions for writs of certiorari will be filed twice more in this proceeding. In these circumstances, the case should not be reviewed by this Court. As Professor Wright observed:

> The Court may issue a writ of certiorari . . . although the decision of the court of appeals is not a final judgment. The lack of finality may be a factor that will induce the Court to deny certiorari. It has said that it should not review interlocutory orders of the courts of appeals "unless it is necessary to prevent extraordinary inconvenience and embarrassment to the conduct of the cause." (Footnote omitted.)

C. Wright, *The Law of Federal Courts* (4th Ed., 1983), p. 731-2. A portion of one of Professor Wright's footnotes to this paragraph is particularly pertinent here:

> [fn. 6] See also *Brotherhood of Locomotive Firemen and Enginemen v. Bangor & Aroostook R. Co.*, 1967, 88 S.Ct. 437, 438, 389 U.S. 327, 328, 19 L.Ed.2d 560, in which the Court, in denying certiorari, said that the fact that the court of appeals had remanded the case for further proceedings made the case 'not yet ripe for review by this Court.'

Id. Because this case raises no unusual issues and is not yet ripe for review, the petition should be denied.

B. There Was No Public Use Of The Nichols Invention Prior To The Critical Date

The burden of proof rests with the party attacking the validity of a patent under the "public use" doctrine,[1] *TP Laboratories, Inc. v. Professional Position-*

[1] Under 35 U.S.C. § 102(b), a person is entitled to a patent unless the invention was in "public use" more than one year prior to the date of the patent application. The trial court explained that, "The essence of 'public use' is the free and unrestricted giving over of an invention to a member of the public or the public in general." (Pet. App. A, p. A-31).

ers, Inc., 724 F.2d 965, 971 (Fed. Cir.), *motion denied*, 466 U.S. 967, *cert. denied*, 469 U.S. 826 (1984), and defendant has neither offered nor identified evidence even approximating "public use". Courts properly look at all the surrounding circumstances to make the determination. *Id.* at 972. After extensive review of all the circumstances here, the trial court and the court of appeals found no public use.

To persuade this Court that a public use occurred, petitioner has presented the facts in a selective and misleading manner. For example, CBS states that prior to the March 4, 1969 critical date, Nichols made his puzzle available to people "everywhere he went." (Pet., p. 4). Much the same characterization was made below and was disregarded.

From 1959 to 1962, one of Nichols' paper models was observed in his room by a roommate and a few close friends. (Pet. App. A, p. A-24). There is no evidence any of these graduate school associates picked up the model or made any use of it. The trial court credited Nichols' testimony that he would have been "astonished" if any of these intimate friends had felt free to do something with his idea. (Pet. App. A, p. A-28).

With respect to the incidents in late 1968 and early 1969, petitioner ignores the district court's observation that Moleculon did classified work for the government and that its offices were not accessible to the public. Further, all Moleculon employees signed confidentiality agreements and were not free to disseminate information obtained through their work. (Pet. App. A, p. A-29). These facts were part of the surrounding circumstances the district court considered in finding Nichols' unbroken retention of control

over his invention. Although the inventor allowed Obermayer to take the puzzle home overnight, the district determined that Nichols' relationship with Obermayer similarly justified a legitimate expectation of privacy and confidentiality. (Pet. App. A, p. A-32). Indeed, in its brief to the trial court, CBS quoted Nichols' testimony that he had "always 'viewed the cube as [his] own property.' " (CBS Inc.'s Post-Trial Answering Brief, p. 18). Based on the totality of the circumstances, the trial court ruled, and the court of appeals agreed, that Nichols retained control over his invention at all times. (Pet. App. A, pp. A-8 to 9, A-32).[2] He had a legitimate expectation of privacy and confidentiality regarding his invention.

The lower courts' findings and conclusions on public use are entirely consistent with *Egbert v. Lippmann*, 104 U.S. 333 (1881), a decision which each of the courts dealt with at some length. (Pet. App. A, p. A-7 to 8, A-30 to 31). Petitioner's treatment of the case is at best incomplete. In *Egbert*, Samuel Barnes made his corset steel invention in early 1855. At that time Barnes provided a woman friend with free and unrestricted use of the invention, including replacements three years later when the devices wore out. Some eight years later, in 1863, Barnes and his friend, then his wife, demonstrated the steels to a third party named Sturgis—again without restriction or limita-

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[2] Among the facts recited by CBS as having occurred before the critical date is a contact between Obermayer and Parker Brothers "concerning possible disclosure to it of the Nichols puzzle." (Pet., p. 5). In the courts below CBS contended this contact was a public use; however, its employment of the word "possible" seems to indicate an acceptance here of the lower courts' determination that it was not.

tion. Barnes then waited another three years before he filed a patent application in 1866. Reviewing these circumstances, the Court found the giving over for unrestricted use by Barnes to his friend, and the demonstration to Sturgis, constituted public use of the invention.

In urging the irreconcilability of the instant case with *Egbert*, petitioner neglects to point out that between 1855 and the date of the patent application, the principle of his invention "was almost universally used in the manufacture of corset steels." *Egbert*, 104 U.S. at 337. A "great part of the record" was taken up with the testimony of manufacturers and vendors who used the invention "before Barnes applied for his patent." The Court continued: "It is fair to presume that having learned from this general use that there was some value in his invention, Barnes attempted to resume, by an application for a patent, what by his acts he had clearly dedicated to the public." *Id.* at 337.

Nothing in the instant case even approximates the strong evidence of public use in *Egbert*. Nichols continuously retained effective control over his invention and the distribution of information concerning it. Unlike Barnes' device, Nichols' invention was never manufactured and was never even known outside the inventor's intimate circle. Certainly it was not in "general" or "universal" use, nor was there anything which even approached the "clear dedica[tion] to the public" found in *Egbert*. *Id.* Having observed Nichols' testimony at length, the trial court commented, "What I see here, by contrast, is the inventor's private use of his own invention for his own enjoyment." (Pet. App. A, p. A-31).

Finally, the trial court found here no commercial activity before the critical date. For this reason the district court observed, "the underlying policy against extending the effective term of exclusivity is not offended by a finding that the Nichols invention was not in public use." (Pet. App. A, p. A-32). In *Egbert*, if the patent had been held valid, the inventor would have been substantially rewarded for his delay.

C. The Lower Courts Correctly Decided That Nichols' Invention Was Not Obvious

In concluding that claims 3-5 and 9 of the Nichols patent were not obvious, the district court, in a lengthy opinion, conducted an exhaustive review of the facts, specifically noting and closely following the factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). The district court reviewed the record of the case and found it possible to conclude "with some confidence" that the Nichols concept would not have flowed from the nearest prior art, the Gustafson patent. (Pet. App. A., p. A-46). The court found the Nichols invention not only nonobvious, but a "breakthrough" and "quantum leap" over the prior art, quoting with approval the testimony of Moleculon's expert Slocum who rated Nichols' invention "at the top of the list of breakthroughs." (Pet. App. A, p. A-47, A-54).

In determining that Nichols invention was not an obvious development over the prior art, the trial court found "most persuasive" the activities of Gustafson, the inventor of the closest prior art. In seeking to improve upon his spherical device and achieve a puzzle of greater complexity, Gustafson actually contemplated a cube—but he failed to perceive the superior

puzzle which it offered. (Pet. App. A, p. A-47). The court of appeals held that petitioner had failed to demonstrate any error in the district court's conclusion of nonobviousness or the factual underpinnings of that determination. (Pet. App. A, p. A-12).

Petitioner now seeks to overcome these findings by urging that the court of appeals has "retreated from its interpretation of controlling authorities of this Court." (Pet., p. 8). As explained more fully below, CBS' argument is based upon an inaccurate statement of the facts and an attempt to create a conflict of authorities, or more accurately, a conflict of approaches to claims interpretation within the court of appeals, where none exists. CBS then argues that "the problem is acute" and invites this Court to intervene to "prevent injustice." (Pet., pp. 8, 10).

Petitioner's argument mischaracterizes the basic facts. CBS repeatedly states that in determining nonobviousness, the courts below relied upon "unclaimed structure having perceived advantages", "the advantages of unclaimed structure", and "structure not recited in the patent claims". (Pet., pp. i, 8, 9). These phrases are both misleading and objectively erroneous. They are misleading because they fail to distinguish between the concept of "advantages", which do not need to be claimed, and "structure", which does; they are erroneous misstatements because the *structure*, i.e., "*cubes*" together with a "*preselected pattern*" are specifically and expressly recited in the claims. (Pet. App. B, p. B-3 to 4).

Claim 3 of the Nichols patent, the principal claim in issue, recites: "A method for restoring *a preselected pattern* from sets of pieces . . . which sets when in random engagement fail to display said *preselected*

pattern. . . ." The claim goes on to describe the rotations of sets of "*cube pieces*" about various axes until the "*preselected pattern*" is achieved. (Pet. App. B, p. 4). The abstract of the patent refers to the "*cube-type assembly*" with "*one distinct color on each of the six faces*". (Pet. App. B, p. 1). The specification and the drawings both set out the *cubical form* of the puzzle and the *pattern of one color on each of the cube's six faces.* (Emphasis supplied; Pet. App. B, pp. B-1 to 2; B-3, Col. 1, L. 59-65; Col 2, L. 21-27). In short, the extraordinary features and method of play of the Nichols' cube are all set out in the specification and claimed in the claims.

While it is axiomatic that claims are to be interpreted in light of the patent's specification and to be read with a view to ascertaining the invention, *United States v. Adams*, 383 U.S. 39, 49 (1966); *ACS Hosp. Systems, Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1577 (Fed. Cir. 1984), CBS contends that the Federal Circuit's decisions on this point are in conflict. Petitioner envisions a conflict between the principle that claims are to be read in light of the specification and the principle that everything in a specification need not be read into all of a patent's claims. CBS' perceived conflict is in reality no conflict at all.

CBS contends that *Environmental Designs*, *Raytheon* and *Jones*[3] forbid the interpretation of claims in light of limitations found in the specifications if

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[3] *Environmental Designs, Ltd. v. Union Oil Co. of California*, 713 F.2d 693 (Fed. Cir. 1983), *cert. denied*, 464 U.S. 1043 (1984); *Raytheon Co. v. Roper Corp.*, 724 F.2d 951 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 835 (1984); and *Jones v. Hardy*, 727 F.2d 1524 (Fed. Cir. 1984).

those limitations do not also appear in the claims. This is a misreading of these cases. *Environmental Designs* and *Raytheon*, in relevant part, merely hold that limitations found in the specifications *need not* be read into the claims. "Environmental's argument that Claim 1 *must* include a limitation found in the specification is thus legally unsound" *citing Smith v. Snow*, 294 U.S. 1, 55 S.Ct. 279, 79 L.Ed. 721 (1935). (Emphasis supplied.) *Environmental Designs*, 713 F.2d at 699. Similarly, the court said in *Raytheon*: "That claims are interpreted in light of the specification does not mean that everything expressed in the specification *must* be read into all the claims." (Emphasis supplied.) *Raytheon*, 724 F.2d at 957.

Petitioner continues its misleading argument by contending that unless an inventor in his patent claims specifically recites not only the structural differences between his invention and the prior art but the particular "advantages"[4] of those structural differences, such advantages must be ignored in determining nonobviousness. This is a clear misstatement of the law. Even unexpected advantages and operating characteristics may be taken into account in determining nonobviousness.

In *United States v. Adams*, 383 U.S. 39 (1966), a companion case to *Graham v. John Deere Co.*, the United States, in asserting obviousness, argued that the unexpected operating advantages or characteristics of the patented battery over the prior art "would

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[4] The "advantages" which petitioner contends must be expressly set out in the claims include such things as the fascinating complexity and superiority of the Nichols puzzle over the prior art.

certainly not justify a patent on the essentially old formula." *Adams*, 383 U.S. at 48. This Court was not persuaded. Noting that the operating characteristics of the patented battery were not only unexpected but "far surpassed then-existing wet batteries", the Court concluded the patented invention was not obvious. *Id.* at 51.[5]

Virtually the identical argument CBS presents here was made to the Federal Circuit in *Preemption Devices, Inc. v. Minnesota Mining & Mfg. Co.*, 732 F.2d 903 (Fed. Cir. 1984), *later proceeding*, 630 F. Supp. 463 (E.D Pa. 1985), *later proceeding*, 229 U.S.P.Q. 270 (E.D. Pa.), *later proceeding*, 231 U.S.P.Q. 297 (Fed. Cir. 1986). There the appellant faulted the trial judge in his determination of nonobviousness for relying on ". . . 'sales pitch features' which was allegedly error because they are not recited in the claims of the patent in contest." *Id.* at 907. To this argument the Federal Circuit responded:

> As for putting advantages or "sales pitch features" in claims, counsel should know that they do not properly belong in claims, the sole function of which is to point out distinctly the process, machine, manufacture, or composition of matter which is patented, 35 U.S.C. § 101, 112, not its advantages. It is entirely proper, nevertheless, in evaluating nonobviousness, for a court to take into ac-

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[5] In his opinion, Judge Stapleton not only acknowledged but quoted *Adams*, where this Court stated that "it is fundamental that claims are to be construed in light of the specifications and both are to be read with a view to ascertaining the invention." (App. A, p. A-37).

> count advantages directly flowing from the invention patented. After all, those advantages are the foundation of that "commercial success" which may be evidence of nonobviousness. *Graham v. John Deere Co., supra.*

Preemption Devices, 732 F.2d at 907.

As stated above, CBS has sought to import a cloud of confusion into the Federal Circuit's claims interpretation methodology by positing a conflict of authorities where none exists. Review of the Federal Circuit cases cited by petitioner makes it clear that the alleged conflict with the instant case is an artful fiction—and one of which that court as a whole is quite oblivious. The Federal Circuit has taken a firm and consistent approach to questions of obviousness, hewing closely to the line set down in *Graham v. John Deere Co., supra*, and *United States v. Adams*. Neither the court of appeals nor the trial court departed from that line in holding the Nichols patent nonobvious.

D. The Citation Of Prior Art Was Properly And Adequately Considered By Both Lower Courts

Finally, CBS turns to a document entitled "Citation of Prior Art to the Patent and Trademark Office Pursuant to 35 U.S.C. § 301" (Pet. App. A, p. A-64 to 65). Petitioner contends that a remand is necessary because the district court failed to make findings regarding the citation and the court of appeals impermissibly determined the weight to be given it. The court of appeals carefully reviewed the citation of prior art and decided to give it no weight based upon its uncontroverted contents and the circumstances which surrounded its filing. (Pet. App. A, pp. A-15

to 16). Because the fact of the document, its date and its general contents were all the subject of a stipulation between the parties during the pre-trial proceedings, there was no occasion for the district court to make any further factual findings regarding the document. (Pretrial Order, p. 7).

Although the district court did not specifically refer to the citation by name in making its *Graham v. John Deere Co.* findings, it gave careful consideration to the entire file history of the patent, which included the citation. The trial court made numerous references in its opinion to the file history and its contents. These references included a review of the early drafts which preceded the patent application (Pet. App. A, pp. A-49 to 50) and a detailed discussion of the file history as it related to CBS' argument on file wrapper estoppel. (Pet. App. A, pp. A-50 to 52). In short, the district court carefully considered the prosecution history and the citation and obviously concluded the citation was unimportant.[6]

On appeal, the court of appeals carefully reviewed the lower court's handling of claim interpretation with reference to prior art (Pet. App. A, pp. A-11 to 12), emphasized that the trial court could, but was not obliged to give weight to the citation, and determined that the trial court had acted correctly since the citation shed no additional light on the task of interpreting the Nichols claims. (Pet. App. A, pp. A-15 to 16).

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[6] FED. R. CIV. P. 52(a), does not require that every imaginable permutation of the facts be set out in the opinion. *Medtronic, Inc., v. Daig Corp.*, 789 F.2d 903, 906 (Fed. Cir.), *cert. denied*, 55 U.S.L.W. 3315 (1986).

The district court's failure to mention the citation in its opinion was for good reason—CBS had failed to argue the relevance of the citation in its brief to the court. Having pressed the matter for the first time in its brief to the court of appeals, CBS cannot now be heard to say that the issue should be remanded to the district court for findings simply because it is dissatisfied with the legal conclusions of the appellate court.

IV. CONCLUSION

CBS's Petition for a Writ of Certiorari should be denied.

Respectfully submitted,

November 26, 1986

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IN THE

Supreme Court of the United States

OCTOBER TERM, 1986

CBS INC.,

Petitioner,

vs.

MOLECULON RESEARCH CORPORATION,

Respondent.

ON PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

PETITIONER'S REPLY BRIEF

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ON PETITION FOR A WRIT OF CERTIORARI TO THE
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PETITIONER'S REPLY BRIEF

Petitioner CBS Inc. hereby replies to the arguments raised in respondent's brief in opposition to the petition of CBS.

JUSTIFICATION FOR THE WRIT UNDER RULE 17

Respondent states that petitioner has failed to identify "special" or "important" reasons under Rule 17 why this Court should review on a writ of certiorari. To the contrary petitioner has shown that the decisions below conflict with this Court's public

use decision in *Egbert v. Lippmann* 104 U.S. 333 (1881) and that if *Egbert* does not control this case the defense of public use will have been unjustly eroded.

In addition petitioner has shown that the precedents governing claim interpretation in the Court of Appeals for the Federal Circuit are inconsistent with respect to whether structural limitations from the patent specification may be read into claims to save them from invalidity. Judge Edward S. Smith of the Court of Appeals for the Federal Circuit has warned that unless this precise inconsistency is resolved the uniformity sought by the Federal Courts Improvement Act of 1982 is in jeopardy. *SSIH Equipment S.A. v. U.S. Intern. Trade Comm'n.*, 718 F.2d 365, 389 (Fed. Cir. 1983)

Finally petitioner has shown that the Court of Appeals for the Federal Circuit has disregarded this Court's directives in *DeMarco v. United States*, 415 U.S. 449 (1974) and *Pullman-Standard v. Swint*, 456 U.S. 273 (1982) and has made improper fact findings at the appellate level concerning the Citation of Prior Art.

There are no more "special" or "important" reasons for this Court to grant a writ of certiorari.

THE ISSUES PRESENTED ARE FINAL AND POTENTIALLY DISPOSITIVE

Respondent has argued that because damages and infringement of Claims 3-5 under the Doctrine of Equivalents remain to be litigated this Court should not review the holding below as to validity of the Nichol's patent in suit. The argument is without merit.

The issues of public use and obviousness raised here by petitioner are final and potentially dispositive of this case. If, for example, this Court decides that the issues raised by the undisputed facts in this case are resolved by *Egbert* in favor of petitioner then the patent in suit will be invalid for public use under 35 U.S.C. §102(b) and there will be no need either for a second trial on remand as to infringement or for a third trial which

would be limited to the question of damages. The parties will have been spared the potentially extraordinary inconvenience here of conducting three trials, with attendant appeals, before seeking any review by this Court.

The question of improper claim interpretation raised by petitioner is also potentially dispositive since, properly construed, Claims 3-5 would be held invalid under 35 U.S.C. §103. This Court could so hold, but even if there were a remand for consideration under 35 U.S.C. §103 of properly construed claims this case would thereby be more effectively and efficiently managed than to deny review now.

Finally, the district court could, on remand, dispose of this case by construing the Citation of Prior Art to bar by estoppel the application of Claims 3-5 to the Rubik's 3x3x3 and 4x4x4 puzzles. Review now by this Court of the appellate court's fact finding concerning the Citation could facilitate the resolution of this case.

THERE WAS PUBLIC USE OF NICHOLS' INVENTION UNDER EGBERT V. LIPPMANN

Contrary to Respondent's arguments *Egbert* was decided precisely to foreclose what actually happened in the present case. Under *Egbert* inventors are not rewarded for dilatory behavior or for allowing friends and colleagues to see their invention, use it and take it home where they show it to other people. In *Egbert* the inventor Barnes let his lady friend use his invention, disclosed it to a male friend and delayed in filing his application until the commercial signposts were auspicious. Similarly the long delay by Nichols in filing his application after his unrestricted disclosures to schoolmates, colleagues and friends and the giving of his puzzle to Obermayer to take home for commercial evaluation enables him now to attempt to cash in on the remarkable success of Rubik's Cube, a success in which he played no supporting role whatsoever. Under *Egbert*, inventors are required to place confidentiality restrictions on transfers of the invention, even to intimate friends. The decisions here below, in contrast, permit inventors to disclose their inventions to friends

and colleagues and let people take the invention home and show it to others without restriction thereby potentially setting in motion events leading to commercialization without any requirement to file an application for patent until the optimal moment. This would not be permitted under *Egbert* and this Court should reaffirm *Egbert*.

Respondent attempts to distinguish *Egbert* but ignores this Court's express holding. For example respondent emphasizes that eleven years elapsed between the transfer of the prototype corset steels to Barnes' girlfriend and the date that Barnes applied for his patent (Resp. brief p. 10). However, this Court held in *Egbert* that if the invention "is in public use or on sale prior to that time [two years before his application as permitted by statute at the time] it will be conclusive evidence of abandonment, and the patent will be void". *Egbert*, 104 U.S. at 337. Thus it is only necessary that the public use exceed the statutory limit, now one year, for a patent to be invalid.

Respondent emphasizes that in *Egbert* the inventor showed it to two people, his woman friend and a friend named Sturgis (Resp. brief p. 10). But in *Egbert* this Court said:

> We remark, secondly, that, whether the use of an invention is public or private does not necessarily depend upon the number of persons to whom its use is known. *Ibid* at 336.

Respondent emphasizes that the invention had gone into almost universal use prior to the application (Resp. brief p. 11). But in *Egbert* this Court said:

> We observe, in the first place, that to constitute the public use of an invention it is not necessary that more than one of the patented articles should be publicly used. *Ibid*. at 336.

The central point is that Nichols transferred the prototype puzzle without restrictions to Obermayer who then took it home with Nichols' consent (Resp. brief p. 10) and showed it to his

wife (Pat. App. A, p. A66, 67). Nichols imposed no obligation of secrecy — in fact he did not impose restrictions of any kind. The invention was complete at the time and Obermayer could have and did exhibit it to a third person, his wife, without violating any restrictions of any type. The actions of Nichols and Obermayer undertaken with respect to the wooden prototype constitute a clear public use under *Egbert*.

The lower courts' decisions on this federal question of public use are in conflict with *Egbert* and this Court should exercise its discretion and grant the writ requested.

THE LOWER COURTS INCORRECTLY INTERPRETED CLAIMS 3-5 IN DECIDING THEY WOULD NOT HAVE BEEN OBVIOUS

Respondent asserts that CBS has mislead this Court concerning the lower courts' basis for upholding Claims 3-5. Respondent is demonstrably incorrect.

CBS has not argued that the lower courts improperly read "advantages" into Claims 3-5. The point is that Claims 3-5 do not recite the *structure* necessary to give rise to those advantages which were relied upon by the courts below to support validity. This is easily demonstrated.

Claim 3 calls for a "preselected pattern". Claim 3 does *not* call for the use of six colors to form that pattern. Respondent would have the courts read into Claim 3 a structural limitation found in the "Abstract" i.e., "one distinct color on each of the six faces" of the cube. (Resp. brief p. 14). This is what the lower courts did and it is exactly the approach that troubled Judge Smith of the Court of Appeals for the Federal Circuit as set forth in his dissent in *SSIH Equipment SA*, 718 F.2d at 383. Judge Smith pointed out that while a "majority" of courts do not "go beyond the language of the claim to the specification to save a claim from invalidity" (*Id.* at 385, ftnte. 3) there is clear Court of Claims precedent for a "minority" rule which supports "reference to the specification in order to save a claim" *Id.* at 386. This inconsistency troubled Judge Smith. He wrote:

> ...Rather than allow the issue to slip silently into the backwaters of the law, I write to ventilate the issue of claim interpretation raised by these precedents ...
>
> The court's failure to reject or even to grapple with, the 'minority' rule in this case, however, leaves two sets of rules governing claim interpretation in the body of precedent of the Federal Circuit — a situation far more damaging to predictability than the consistent application of the more subjective rule. *Id.* at 389.

This Court should grant the writ requested in this case to resolve the foregoing inconsistency in the Federal Circuit precedent which, in the present case, has simply been perpetuated.

THIS COURT SHOULD REMAND FOR FINDINGS ON THE CITATION OF PRIOR ART.

Respondent has argued that the district court in effect did make findings concerning the Citation of Prior Art because the Citation was "the subject of a stipulation". The stipulation to which respondent refers was as follows:

> On May 24, 1982 prior to the commencement of this lawsuit, Moleculon filed in the United States Patent and Trademark Office its "Citation of Prior Art", commenting on the subject matter of two prior art patents to one Gustafson, namely, U.S. patent 3,081,089 and Japanese patent 38-l0669.

This is simply a stipulation which identifies the Citation, and contains nothing of substance. It is certainly not a stipulation which goes to the interpretation or significance of the Citation, and the district court made no such finding even though the Citation was referred to in the Pretrial Order and was argued to the court in post-trial argument. There is no question that the Federal Circuit improperly made its own findings concerning the meaning and significance of the Citation.

CBS's Petition for a Writ of Certiorari should be granted.

Respectfully submitted,

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